MARINE REVIEW.

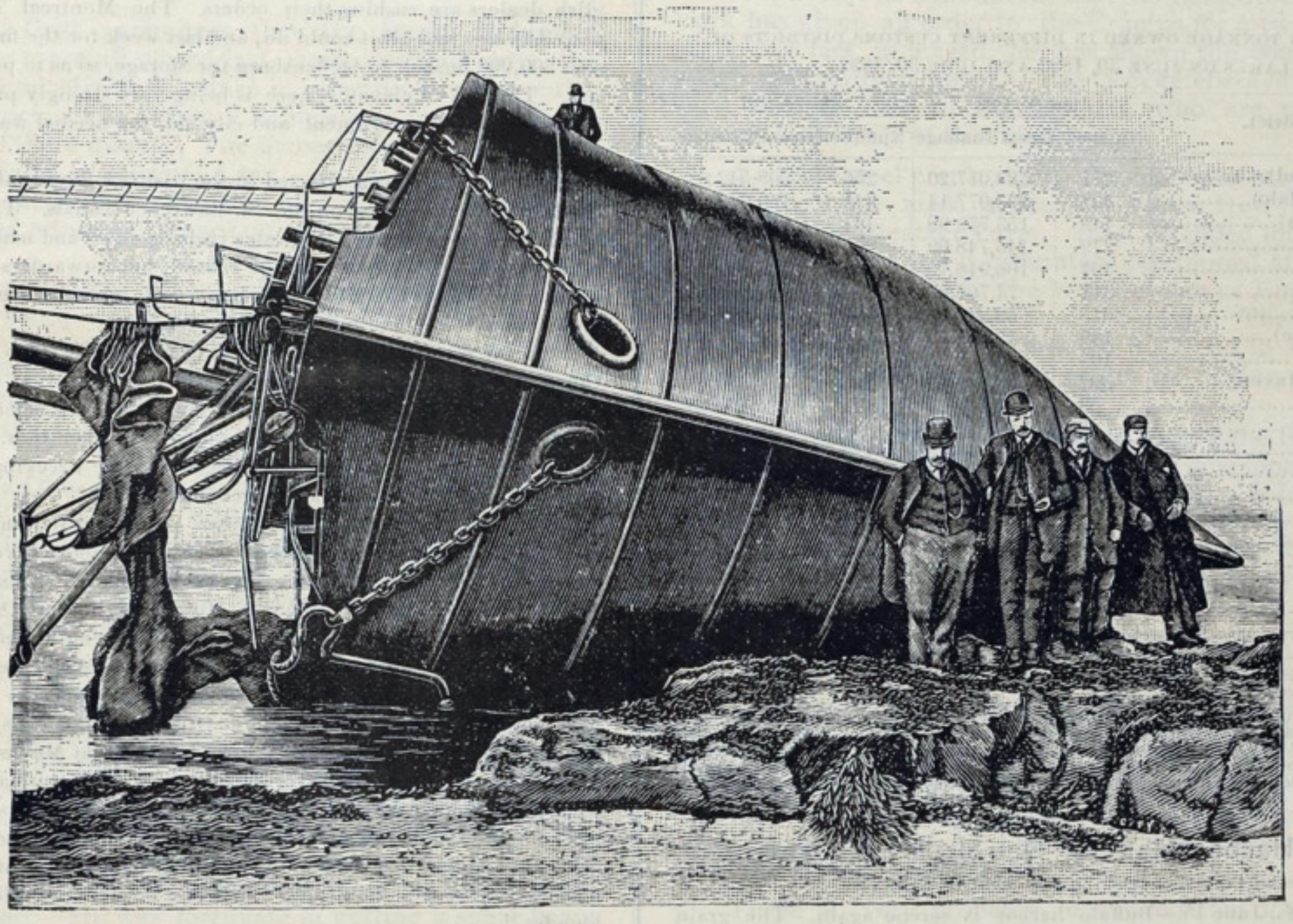
VOL. VII. CLEVELAND, O., AND CHICAGO, ILL., JUNE 15, 1893. No. 24.

Lake Freight Matters.

As shown by the report of St. Mary's Falls canal traffic to June 1, the movement of coal to Lake Superior and ore down the lakes from the shipping ports above the canal is little more than half what it was on the same date a year ago. The late opening of navigation, a heavy movement of grain and delay in port have brought about this condition in coal and ore, and, strange to say, it is a state of affairs with which both vessel owners and shippers express satisfaction. It is easy to understand why vessel owners are satisfied with a shortage in the movement of coal and ore, as light shipments at present might be expected to mean an active latter half of the season with increased freight rates. The ore and coal shippers refuse to look upon the situation in this light, however, as they claim that the aggregate movement of both commodities will be reduced so much that the grain shipments, which have upheld freights on a moderate basis so far, will not furnish high freights for surplus tonnage from the other trades. As an indication of the opinions advanced along this line by ore dealers, Col. James Pickands recently ventured the prediction that the total output of ore from Lake Superior mines this season will not be above 6,000,000 tons. Coal dealers, who also understand fully the shortage in their line, and who have allowed tonnage to go begging at very low rates, say that the season must close with a shortage of coal in the northwest, much greater than that of the past year, as it is not only a physical but a financial impossibility to move the coal. In the meantime, the shipments of grain, about which there is, unfortunately, uncertainty at all times, has been such as to maintain rates that are decidedly improved over those prevailing at the opening of the season, and the vessel interests have the satisfaction of knowing that decreased coal and ore shipments up to this time can not work to their disadvantage. During the past few days the freight market has, however, lost a portion of its strength, the Duluth grain rate dropping to 3 cents, with a few Escanaba ore charters at 70 cents and a marked reduction in coal freights out of Buffalo, but whether this weakness is temporary or not can not be told until more transactions are recorded towards the close of the present week.

Quite a Wrecking Job.

Stories sometimes told by lake captains of vessels being landed among clusters of trees on the islands of Lake Michigan during heavy storms, or carried far into the corn fields that line the shores of Lake Huron in times of bad weather on that lake, are usually taken with the necessary allowances, but in the case of the stranded English vessel shown in the engraving on this page there is proof from the camera at hand. The picture



THIS VESSEL IS STRANDED.

is reproduced from the Marine Engineer of London on account of its novelty. The boat is named Ithfaen and was stranded while on her maiden voyage from a Clyde ship yard to Liverpool. She is a steel screw freight steamer, built for the coasting trade. The illustration shows the position of the vessel at low water, of course, but is nevertheless interesting as indicating how far a boat may be carried out of the water by heavy seas. Although this vessel's starboard side was literally punctured from end to end, she was patched up and towed broadside as she lay on the rocks to a beach, stern foremost. With the aid of pontoons and a system of ballasting she was then righted with the tide and docked. After the whole of the ceiling had been cut away by the divers, in preparing to move the vessel, and boxes fitted and bolted over the broken plates and frames, about 80 tons of stone ballast was placed inside close to the peak bulkhead for leverage, while two pontoons were attached on each side of the stern for steadiment.

Tonnage of Lake Customs Districts.

Tables printed herewith were prepared from the annual report of the United States commissioner of navigation for the year ending June 30, 1892. They show the number and tonnage of different kinds of vessels making up the lake fleet, and also the number of vessels, with their tonnage, owned in the different customs districts of the lakes. The Cleveland district continues to increase its lead in the amount of tonnage controlled by its vessel owners, although the owners of Buffalo, Port Huron, Detroit, Milwaukee, Chicago and Grand Haven all control a greater number of vessels, which are, of course, not as large in tonnage.

TABLE SHOWING DIFFERENT KINDS OF VESSELS MAKING UP THE LAKE FLEET, AND ALSO THE INCREASE IN LAKE TONNAGE DURING THE YEAR ENDING JUNE 30, 1892.

Class.	June 30, 1892.		June 30, 1891.		Tonnage increase, per cent.
	No.	Gross tons.	No.	Gross tons.	
Steam vessels	1,631	763,063.32	1,592	736,751.53	3.5
Sailing vessels	1,226	319,617.61	1,243	325,131.06	*1.7
Canal boats	731	75,580.50	703	72,515.42	4.2
Barges	69	25,321.12	62	20,472.37	23.7
Total	3,657	1,183,582.55	3,600	1,154,870.33	2.5

*Decrease.

TABLE SHOWING TONNAGE OWNED IN DIFFERENT CUSTOMS DISTRICTS OF THE LAKES ON JUNE 30, 1892 AND JUNE 30, 1891.

Customs District.	June 30, 1892.		June 30, 1891.	
	Number.	Gross Tonnage	Number.	Gross Tonnage
Cugahoga (Cleveland)	271	223,017.20	256	209,542.98
Buffalo Creek (Buffalo)	322	163,077.14	315	160,668.38
Huron (Port Huron)	449	153,779.98	441	153,382.27
Detroit	279	146,748.09	292	150,335.12
Milwaukee	404	106,946.19	395	105,485.26
Chicago	311	74,706.00	332	73,999.45
Champlain	*615	59,229.98	*592	56,871.73
Superior (Marquette)	139	57,448.63	141	52,254.00
Sandusky	107	48,159.75	89	41,193.21
Michigan (Grand Haven)	302	32,943.23	293	32,050.03
Erie	53	31,039.20	46	29,740.00
Oswegatchie	45	22,531.13	55	26,685.64
Oswego	*113	17,844.18	*113	18,042.89
Miami (Toledo)	68	17,807.84	63	17,053.62
Niagara	23	12,759.32	21	10,252.93
Vermont	37	5,666.53	40	5,983.72
Genesee	*25	3,988 48	*24	4,259.00
Cape Vincent	51	3,388.89	50	3,692.21
Duluth	39	1,458.18	35	2,678.49
Dunkirk	4	202.61	7	699.45
Total	3,657	1,183,582.55	3,600	1,154,870.38

*Largely canal boats.

These tables do not include boats and lighters, decked and not masted, employed within the harbor of any town or city, or canal boats and barges, without sails or internal motive power of their own, employed wholly upon canals or the internal waters of a state, or barges or boats plying on rivers or lakes of the United States and not engaged in trade with contiguous foreign territory, and not carrying passengers, or boats under 5 tons, net.

Buffalo Harbor Matters—Detroit River Lights.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., June 15.—Buffalo harbor is serene again. The grain blockade was never much but a name, though at one time there was some detention. Receipts have fallen off and there will doubtless be room enough for the rest of the season. The heavy takings of grain at Duluth would find plenty of room here should it all come down in one day. The canal is again the heavy east-bound carrier, having taken over 1,000,000 bushels of wheat out last week, more than all the railroads. Both rail and canal rates are up; rail to 6¼ cents and canal to 5¼ cents on wheat to New York. This is an exorbitant rate these times, by either routes, but the situation appears to warrant it. Freights appear to go by contraries. The distance is about half of that from Duluth here and the rate is twice as much.

And so the government proposes to let Detroit river be a light unto itself after July 1. Though it is known that the new light-ships building for the Lime-Kilns and Ballard's reef will not be out of the builders' hands till well into July, to say nothing of equipping them with lighting apparatus, the government has notified the Lake Carriers' Association that it does not propose to renew the contract for lighting these points which it now has with the association and which expires with June. It can hardly be possible that they will be left dark for an indefinite time, but it looks as though they would unless something is done.

In spite of reports to the contrary, it is the opinion of those acquainted with the case that the British minister at Washington has not moved in the wrecking reciprocity matter yet; at any rate Canada has not issued any orders in the matter. If things drag along in this way much longer the fall storms will be here before the details are arranged. There is need of such a regulation here almost any time. The Canada shore is very close and there has been more than one vessel ashore there this season.

Of course there were plenty of people to claim that the newspapers manufactured the story of the foundering of the Nyack last Sunday. The truth was that a street rumor to that effect persistently eluded all effort to locate it till New York was calling for information on the subject, and not till past 3 a. m. on Monday was the vessel discovered in Erie. The search for her was entirely on the theory that she was safe and it was not given up till she was found. Had Capt. Parsons reflected that the 60-mile gale he went through would make people uneasy when it was discovered that he didn't pass Detroit on time, he would probably have made known his whereabouts.

The collapse of coal freights, 10 cents at a time, was hardly expected, and when the heavy takings at the drop rate are coupled with the fact that very little business is usually done when rates go down, it looks as though the vessel men were very neatly done by the shippers. The burning up of upwards of 50,000 tons of coal along with the splendid new Reading stock trestle no doubt had something to do with the decline.

Rushing Grain Through Canada—Dominion Marine.

Special Correspondence to the MARINE REVIEW.

KINGSTON, ONT., June 15.—The grain trade with the west continues to be very large. The forwarding companies are using every facility to make speedy work. The Kingston and Montreal Company has now handled 2,000,000 bushels, almost as much as they have handled in a full season before. English dealers are rushing their orders. The Montreal Transportation Company has also had all it could do, and last week for the first time in its history sent 300,000 bushels to Ogdensburg for storage, so as to prevent delays to vessels. The lack of elevators here is being very strongly presented and it is expected that with government and city aid the needed warehouses will be provided.

Attention has been directed in the past few days to the old fashioned and obsolete methods in use on the St. Lawrence canals. The barge Hall struck and carried away a gate, the water rushing down and making it dangerous for other vessels. Luckily no damage ensued, but forwarders are demanding a telephone service, so that when such important interests are at stake quick communication can be had up and down the canals.

Marine men are wondering what causes are at work to prevent President Cleveland from signing the proclamation putting into effect reciprocity in wrecking. The governor general of Canada had his signature to the measure before June 1, the time set for it to go into operation. On Lake Ontario reciprocity would be equally advantageous to the wrecking concerns of Kingston and Oswego. Is there a "nigger in the fence?"

The St. Catherine's Journal makes complaint that not only are materials used in ship building taxed, while completed imported vessels can secure entrance free, but that different rates of duty on materials are imposed at different times and places. In 1890, Muir Bros. of Port Dalhousie paid 17½ per cent. on steel plates from Glasgow used for strengthening wooden vessels; in May, 1891, the same firm imported similar plates and were taxed 30 per cent. This last tax was protested but no change or explanation has yet reached the firm from the customs department at Ottawa. "But this," says the Journal "is not the worst, for Muir Bros. have learned that Messrs. Adam Hope & Co. Hamilton, imported plates for repairs and they were admitted duty free." The paper concludes: "A matter of this kind is too serious to be lightly passed over, and if the advance as in Messrs. Muir's case from 17½ to 30 per cent. duty is due to bureaucratic stupidity, a government that was honest and meant well towards the people would lose no time in rectifying such a serious blunder."

Lumber charters are now being made at Toronto at $1 per 1,000 feet. Coal from Oswego to south shore points remains at 30 cents per ton.

Invention of a Marine Nature.

Specially reported from the patent office, Washington, D. C., for the MARINE REVIEW.

498,256—Beacon or buoy, by John M. Foster of Cranford, N. J.; filed Aug. 25, 1891; serial number, 403,673.

498,572—Water jet propulsion for steamers, by Frederic W. Richardson of Hartlepool, England; filed Oct. 24, 1892; serial number, 449,836.

498,677 to 498,682—These six patents are by Alexander McDougall, and are extensions of the whaleback patents, being intended to cover ships of war. They are all close to the parent patent, the differentiation being to admit a peculiar armor, a system of arranging guns and arrangements of cabins and spar decks.

498,707—Copper coating the hulls of vessels, by Thomas S. Crane of East Orange, N. J.; filed Oct. 12, 1892; serial number, 448,628.

499,087—Apparatus for determining the bearings of a ship and its course, by Edwin Baker of Cardiff, England; filed Dec. 27, 1892; serial number 456,413.

Copies of patents can be had from the MARINE REVIEW, No. 516 Perry-Payne building, Cleveland, O., at the uniform rate of 15 cents each.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	$100 00	$.....	$.....
Champion Iron Company.....	25 00	26 00	.....
Chandler Iron Company.....	25 00	.....	40 00
Jackson Iron Company.....	25 00	.....	75 00
Lake Superior Iron Company.....	25 00	26 00	.....
Minnesota Iron Company.....	100 00	.....	60 00
Pittsburgh & Lake Angeline Iron Co.....	25 00	.....	140 00
Republic Iron Company.....	25 00	.....	9 25
Ashland	25 00	.....	.....
Section Thirty-three.....	25 00	1 00	.....
Brotherton.....	25 00	2 00	2 50
Iron Belt.....	25 00	2 40	2 75
Aurora.....	25 00	6 50	7 00

On Wednesday, the 6th inst., 140,237 gross tons of ore had been shipped from Two Harbors, and of this total 74,316 tons was from the Minnesota mine, 71,076 tons from the Chandler and 3,815 tons from the Cincinnati. On the same date the shipments from Ashland aggregated 174,894 gross tons, divided as follows: Ashland 15,790 tons, Aurora 32,227, Colby No.2 2,781, Tilden 16,728, Montreal, north vein, 10,254, Brotherton 2,166, Comet 5,035, Carey, west, 4,621, East Norrie 7,911, Eureka 4,397, Newport 3,982, Norrie 37,582, Pabst 24,259, Sunday Lake 7,156.

The Diamond Drill announces that the Dunn, Columbia and Lamont mines were all closed last week, leaving only the Mansfield, Claire and Michigan mines in operation in the entire Crystal Falls district. The Dunn, a Schlesinger property, is the most important of these mines. The management asks for a reduction in the royalty of 40 cents a ton. It is not difficult to understand, with the present condition of the iron ore market, why non-Bessemer mines are closed on such royalties.

At the Pioneer mine, a Vermillion range property from which heavy shipments were expected if the market furnished a profit in iron ore this season, no effort is being made to take out ore in large quantities but development work is going on actively with a force of nearly 100 men. Large quantities of ore are in sight ready to be taken out if the market warrants it.

Officers of the Ohio Mining Company, Missabe range, elected recently are: R. S. Munger, president; E. D. Sawyer, vice president; Fred Barrett, secretary; T. H. Pressnell, treasurer; James E. Campbell, E. D. Sawyer, H. E. Becker, Fred Barrett, R. S. Munger, M. R. Baldwin, J. K. Persons, George S. West and T. H. Pressnell, directors.

Personal Mention.

Commander Robley D. Evans has just passed, with the record "excellent," his examination for promotion to the rank of captain in the navy.

Engineer-in-Chief Elliott of the Goodrich company, Chicago, was in Cleveland Tuesday looking for a walking beam for the steamer Muskegon, which met with an accident on Lake Michigan a few days ago. He was fortunate in getting a spare beam from Manager Newman of the Cleveland and Buffalo line.

Friends of Capt. James Davidson of West Bay City are having a quiet laugh over his mishap with the tug Perfection, while taking her to Chicago. They say that the Perfection is not the first boat that Capt. Davidson put ashore, while taking a hand at sailing occasionally, since he quit the deck and made a million or more at building wooden ships.

From one of Col. Ludlow's numerous friends on the lakes we learn that Gen. Russell A. Alger recently wrote as follows regarding the finding of the army court in the case of Col. Ludlow with the light-house board. "While the light-house board may find some grain of comfort from the findings of the court, I consider it a full vindication of Col. Ludlow's ability, purpose and work, and I congratulate not only Col. Ludlow but the vessel owners also, that through his efforts and zeal the St. Mary's river is lighted, and that properly."

A few copies of Patterson's Nautical Dictionary held by the MARINE REVIEW are all that are for sale anywhere, since the destruction by fire of plates and all other material entering into the work. The price, $5, has not been raised.

In General.

During the six days that one of the Atlantic liners like the Majestic is crossing the ocean, half a million tons of water for condensing purposes passes through twenty miles or more of condenser tubes.

The Umbria has the largest propeller of all the Atlantic liners. It is 24½ feet in diameter and weighs thirty-nine tons. The boss cost $5,000; the blades of manganese bronze cost $600 a ton, or over $16,500 for the four.

Again two graduates of the Annapolis Naval Academy, who were sent to Scotland by the navy department, have carried off the highest honors at the school of naval architecture in Glasgow. These young men will, of course, be given positions in the construction corps of the navy.

A series of articles by W. H. Wheeler on the subject of dredging,now being published in the Engineer of London,should prove interesting to managers of concerns engaged in this industry on the lakes. In machinery and methods used in dredging England is far ahead of this country.

It is stated that the Canadian Pacific Railway Company will shortly purchase the steamships Arizona, Alaska and City of Rome, place them upon the Vancouver and Japan route, and transfer the steamers from that route to the Quebec and Liverpool service which the road proposes to establish.

If it is true as announced, that William Rockefeller of New York has given an order to the Cramps for a twin-screw steam yacht 240 feet in length, he has shown the common sense for which the family is noted. The Rockefellers are among a few very wealthy men of this country who are plain American citizens in matters of this kind.

A nickel steel crank shaft, the first ever cast in the United States, has been made at the Bethlehem Iron Works for the American line steamer Paris. It is intended for a spare shaft. The tensile strength was accurately determined at 90,000 pounds to the square inch, while the best German or English steel will break at a maximum test of 65,000 pounds. The shaft is hollow, a five-inch hole having been bored from end to end, so that if there had been a defect in the center the boring would have removed it.

According to the San Fransisco papers the final trial trip of the coast defense steamer Monterey, has developed the fact that she is a good sea boat in a moderate sea but a failure as a fighter. Her big guns wrecked their hydraulic machinery when fired but once, and if they were loosed for action in a sea they would tear the vessel to pieces. It is claimed that the Union Iron Works carried out its contract faithfully but the fault is in the designs, and it will require much time and money to remedy defects.

Work on two more screw passenger steamers for the Old Dominion line will be begun shortly at the Roach ship yard, Chester, Pa. The boats will be duplicates, 322 feet over all, 40 feet beam and 34½ feet depth. They will be similar in construction and finish to those heretofore built for the same company and will cost about $350,000 each. The engines will be triple expansion of about 3,000 horse power, and the boilers will be of the return tubular type.

There is, very probably, no foundation for the story that a company has been organized here to run a line of whaleback steamers between New York and Mexican ports in the coal and coke trade. The whalebacks, it is said, would be at an advantage in entering Mexican ports, on account of light draft. The Mexican International Steamship Company, which started a line of boats from New York a short time ago, was not a financial success, as it was found that there was not trade enough to warrant the expenditure required.—Marine Journal, New York.

Owners of steamers built of mild steel are beginning to find out that when subjected to heat and the action of acids it deteriorates much more rapidly than iron. In some cases the inner plating of the double bottom in the range of the engine room has corroded through in a very short time. To meet this difficulty in numbers of new vessels, in the parts most likely to be affected, iron has been used. These are in addition to the inner plating of the double bottom, the frames and reverse frames in the coal bunkers. In a large cargo steamer now building, the difficulty has been met by a large increase of the thickness of the inner bottom plating. Not only has the reduction allowed for the use of steel instead of iron not been taken advantage of, but the plating has been made much thicker than it would be required if of iron.—Nautical Magazine.

A Great System of Electric Buoys.

WESTERN OFFICE, MARINE REVIEW,
No. 701 Phoenix Building, CHICAGO, Ill., June 15.

On Saturday night the whole of the lake front, from VanBuren street to the world's fair grounds will be in a blaze of glory and electricity, such as has never been witnessed in any part of the world. Thirteen one hundred candle power lights placed on buoys, each one visible for eight miles, will blaze out simultaneously, and make navigation to the fair grounds as easy as at noonday. It will be the formal starting of the system of electric light buoys from Chicago to the exposition. Saturday has been chosen on account of its being one of the nights on which the grounds are illuminated, and the crowds of people travelling by steamer to the park will be treated to a signt never before equalled for size and splendor in lighting channels for navigation after dark. Last Saturday the cables, fourteen miles in all, arrived from New York. This was all that was lacking, and the work was rapidly pushed during the week. Commander John J. Brice, U. S. N., inspector of the ninth light-house district, stationed on the light-house tender Dahlia superintends the construction of the system. The work is being done by the Bishop Gutta Percha Company of New York, the same company that laid the system in Gedney's channel, New York harbor. Compared with the lake front system, the New York plant is very primitive, and of much less power and size.

The system consists of thirteen spar buoys, placed half a mile apart, each surmounted by an incandescent light of one hundred candle power, and visible eight miles in clear weather. In foggy weather pilots will have no trouble in locating each succeeding light after reaching the first one, which is near the piers. As the buoys are painted red they will be plainly visible during the daytime. They are placed in the middle channel and mark what is known as the "fair way" to the exposition. The line is in the center of the channel, and vessels will be required to keep to the starboard side and at a distance of one hundred yards to prevent fouling with the buoys. The current is 2,000 volts strong, the greatest current ever used under water. It is communicated to the lamps by cables, two in number, called the main and auxilliary cables. The auxilliary cable starts from the end of the steamboat pier at the fair grounds. A small house is located there sheltering the converter, which allows just enough current to pass into the cable to supply the lights. The power will be supplied by the exposition. From the end of the pier, about a half a mile into the lake, the first buoy will be placed. Each buoy is anchored to the bottom by anchors weighing one and one-half tons. The lamps will be about 12 feet above water. The auxilliary cable enters the buoy near the bottom and runs up through the timber until it reaches the top, then turns and runs down the opposite side to the bottom, and thence to the next buoy. Instead of connecting with the lamps as with an ordinary incandescent lamp, a series of coil taps the cable a short distance from the lamp. This runs across to the cable as it returns to the lake on the opposite side of the spar, and allows only enough of the current to go into the lamp to produce one hundred candle power.

At the end of the line, about one-half a mile off VanBuren street pier, the last buoy of the series will be located. After leaving the buoy, the auxilliary cable will connect with the main cable. This runs along the bottom of the lake along the line taken by the auxilliary cable, and ends at the converter at the end of the pier at the fair grounds, thus completing the circuit.

The entire length of cable will be about fourteen miles. At the deepest place it will be about 30 feet from the surface of the water, and in no case will it be near enough for vessels to become entangled in it. Following the curves of the channel established by the survey last year the lights will at no point be over one and a quarter miles from the shore line. The main cable is about an inch in diameter. It was made to be very flexible, and on this account had seven separate wires for the core, instead of one large wire. One wire forms the center with the rest wound around it. Around these wires is placed three layers of gutta percha, thus guarding against a possible leak which might occur if one alone was used. Two layers of jute, wound in different directions cover the gutta percha, and the whole is wound with a wire sheath, the jute forming a bed for the wire. The wire guards against sharp rocks, and takes up the wear from the motion of the water.

The lamps are made on somewhat different plans from the ordinary incandescent lamp. The globes are round, and are about a foot in diameter. The filament as it passes through the shell is given three twists, instead of a plain loop. Each is placed directly on top of its buoy and protected by a metal cage.

Like many other world's fair schemes which were nursed so fondly by their preceptors over a year ago, and which have shown themselves to be delusions in the light of the actual test, the passenger business by steamer to the fair grounds is giving ample proof that it has been over crowded and that the season has been forced. Every available landing place at the city and in the immediate vicinity of the grounds was taken before navigation opened this spring and agents for the various lines scoured the lakes in a search for steamers with which to gather in the quarter dollars of the visiting public. The steamers were easily found, but their operators have found the task of filling them with passengers enough to pay expenses, let alone any profit, was a Herculean one. The reason is plain. The season was backward, and cold weather has hung on with a tenacity only shown in the frozen wilds of the northwest. It is only justice to the managers of the various lines, however, to say that they have put up an ideal service, and if the public has not taken to it the fault lies with the weather department and not with themselves. With the red hot days of July and August, the business may prosper and enough money may be made to recoup the losses of May and June, but the show for any profit on the season's business is considered very small.

Superior Bay Lights.

The light-house board gives notice that on or about the 15th inst. the Superior pier head light station will be removed from the north pier, Minnesota side, and re-established without change of order or characteristics of light, on the south pier, 56 feet from its outer end, Wisconsin side of the entrance to Superior bay. The height of the tower will not be changed, but the focal plane of the light will be 49 feet instead of 53 feet above lake level, and the light may be seen in clear weather, the observer's eye 15 feet above the same level, 14¼ statute miles. On the same date the following described post lights will be established in Superior bay:

Superior bay entrance range post lights—Two fixed white lens-lantern lights, each on an upright on Wisconsin point, just inside the entrance to the southeasterly end of Superior bay. The range will guide into the southeasterly end of Superior bay through the natural channel from Lake Superior.

Superior bay range post lights—Two fixed white lens-lantern lights, each on an upright on Wisconsin point, just inside the entrance to the southeasterly end of Superior bay. (The front light of this range is the front light of the Superior bay entrance range.) The range will guide up Superior bay from inside the entrance past the old dock on Minnesota point to the entrance to the dredged channel to Quebec dock.

Quebec channel post light—A fixed red lens-lantern light on an upright rising from a square pyramidal cluster of piles in the west angle of the intersection of the main channel of Superior bay and the dredged channel to Quebec dock.

Superior bay channel (lower) post light.—A fixed white lens-lantern light on an upright rising from a square pyramidal cluster of piles on the northeasterly side of the channel about 3,500 feet from Quebec channel post light.

Superior bay channel (lower middle) post light.—A fixed white lens-lantern light on an upright rising from a square pyramidal cluster of piles on the northeasterly side of the channel about 3,800 feet from Superior bay channel (lower) post light.

Superior bay channel (upper middle) post light.—A fixed white lens-lantern light on an upright rising from a square pyramidal cluster of piles about midway of the middle ground, northeasterly side of the channel, and about 4,700 feet from Superior bay channel (lower middle) post light.

Superior bay channel (upper) post light.—A fixed white lens-lantern light on an upright rising from a square pyramidal cluster of piles on the northwesterly end of the middle ground, abreast of the lumber docks southeasterly of Connor's point, northeasterly side of the channel, and about 2,000 feet from Superior bay channel (upper middle) post light.

Connor's point range post lights.—Two fixed lens-lantern lights, front light white, rear light red, each shown from an upright rising from a square pyramidal cluster of piles southeasterly of Rice point, Superior bay. The range will guide in the channel from the Northern Pacific railroad bridge, Saint Louis bay, past Connor's point into Superior bay.

Rice point range post lights.—Two fixed lens-lantern lights, front light white, rear light red, each shown from an upright rising from a square pyramidal cluster of piles southeasterly of Rice point, Superior bay. (The rear light of this range is the rear light of the Connor's point range.) The range will guide in the channel along the northeasterly side of Rice point from its southeasterly point nearly to the Ohio Central coal dock.

Ohio Central coal dock post light.—A fixed red lens-lantern light on an upright rising from a square pyramidal cluster of piles southeasterly of the northeasterly end of the Ohio Central coal dock, northerly end of Superior bay. The light marks the turning point from the northerly part of Duluth harbor into the channel marked by the Rice point range.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on June 10, 1893:

	Wheat, bu.	Corn, bu.
Chicago	20,061,000	2,385,000
Duluth	11,403,000	.....
Milwaukee	1,422,000	9,000
Detroit	1,349,000	12,000
Toledo	2,448,000	144,000
Buffalo	3,974,000	292,000
Total	40,657,000	2,842,000

At the points named there is a net increase for the week of 112,000 bushels of wheat. Strange to say, the stocks of corn, although changed at different ports, are in the aggregate just as they were a week ago.

Big Decrease in Lake Superior Business.

The movement of coal and ore to and from Lake Superior up to June 1 is little more than half what it was on the same date a year ago, as shown by the following summary, made up from the monthly statements of St. Mary's Falls canal business, furnished by Gen. O. M. Poe of Detroit:

LAKE SUPERIOR COAL AND ORE MOVEMENT.

	Coal up, net tons.	Ore down, net tons.
June 1, 1892	553,224	522,826
June 1, 1893	390,792	287,652
Shortage	162,432	235,174

In April of last year 151,495 tons of coal passed up through the canal, and the downward movement of coal aggregated 19,485 tons. This year there was no ore loaded at Lake Superior ports until about May 10, and the coal movement was equally slow in starting. Considering this delay, ore shippers have done fairly well, but these figures would indicate that there will again be a shortage of coal when the season is at an end. If it were possible to obtain figures equally reliable regarding Lake Michigan business, a shortage almost as great as that shown from Lake Superior would probably be found to exist.

Freight of all kinds passing through the canal during the month of May, 1893, aggregated 256,977 net tons, of which 94,473 tons was east bound and 162,504 tons west bound. The traffic was divided as follows:

	East bound.	West bound.
Coal	.....	390,792 tons.
Flour	612,495 bbls.	20 bbls.
Grain	.....	300 bu.
Corn	591,504 bu.	.....
Wheat	8,618,953 bu.	.....
Building stone	4,721 tons.	.....
Copper	10,235 tons.	.....
Manufactured iron	.....	4,210 tons.
Iron, ore	287,652 tons.	.....
Iron, pig	1,765 tons.	.....
Salt	.....	33,393 bbls.
Lumber	55,484 M. feet.	.....
Silver ore	.....	.....
Unclassified freight	14,241 tons.	37,392 tons.
Passengers	293	.....

During the month 1,043 steamers, 392 sailing vessels and 76 rafts and unregistered crafts, making a total of 1,511 vessels in all, passed through the canal. The lock was in operation 476 hours, 40 minutes. The total amount of registered tonnage was 1,180,763; freight tonnage 1,174,900; passengers reported 758, and the number of lockages 684. As compared with 1892 the report shows a decrease of 287 passengers, 366,940 in registered tonnage, and 360,168 in freight tonnage. Owing to the backward season, the canal did not open until twelve days later than last year and there was no east-bound freight up to the 10th of the month, and only 1,802 tons up to the 12th, which fully accounts for the decrease. The traffic for the last ten days of the month averages more than for the same period last year. No rafts passed the rapids during the month.

Minnesota Iron Company.

Annual meetings of the Minnesota and Chandler Iron Companies, two of the most important companies in the Lake Superior iron district, have been held within the past few days. These companies, which are practically under one control, have been paying regular dividends, the Minnesota dividing 6 per cent. annually, and the Chandler $1 a share every two months. There was no definite information to be had, even at the Cleveland office of the Minnesota company, regarding the decision of the directors as to dividends in the future, but it is the general opinion of local stockholders that, for the present at least, dividends will be passed. Although both companies have large surpluses, there was a disposition among some of the managers to discontinue dividends, on account of the depressed condition of the iron market. If such action was taken by the directors of the Minnesota and Chandler mines, there is left, of the long list of dividend-paying corporations, only the Lake Angeline and one or two other companies to share profits this year. A number of the companies have balances to their credit, of course, but they are big corporations, managed on a financial scale of great magnitude, and the smaller stockholders, who look to dividends very earnestly, are informed in times like the present that the money is withheld on account of the uncertain conditions that have been encountered of late in the iron mining business.

International Maritime Congress.

During the coming month the second meeting of the International Maritime Congress will be held in London. The first meeting was held in Paris in 1889, when a number of papers on various maritime subjects were read and discussed, and visits were made to the more important seaports on the northern and western coasts of France. The result of the first meeting was so satisfactory that the members determined to make the congress permanent by the appointment of an international commission, with its headquarters at Paris. The commission comprises representatives of thirteen European nations, and at their meeting in Paris last July it was determined to hold this year's meeting in London. The congress will be divided into four sections. The first section will deal with harbors, breakwaters, and protection of coasts, the second section with docks and their equipment and the third section with shipbuilding, marine engines, and auxiliary machinery on board ship. The list of papers promised in the third section comprises one on "Shipowners and Ship Builders in their Technical Relationships," by Mr. A. Denny, of Dumbarton; "Ocean Passenger Ships," by Professor J. H. Biles; "Steam Communication with the Continent, Past and Present," by Mr. A. E. Seaton, of Hull; "Transport of Oil in Bulk," by Mr. S. Fortescue Flannery; and two papers by Mr. C. E. Stromeyer, one on the "Resistance of Ships moving in Water" and the other on "Frictional Resistance of Steam in a Steam Engine." The fourth section will deal with light-houses and their illumination, fog signals and electrical connection of light-houses and light-ships with the shore. Of the papers already announced for this section, seventeen are from writers in Great Britain, ten from France, two from Russia, seven from Italy, four from Denmark and two from Belgium.

An Odd Comparison.

The Polytechnic, a journal published at Troy, N. Y., by the students of Rensselaer Polytechnic Institute, contains a report of an address on the "Development of the Steamship" delivered at the institute recently by Horace See, naval architect of New York. In the course of the address Mr. See said:

"In order to thoroughly appreciate the great development of the steamship, which borders on the marvelous, we have only to make a few figures as to the possibility of propelling a vessel with oars at the calculated speed of the Campania. If it were possible to place 300 oars on each side, making 600 oars altogether, each worked by three men, there would be 1,800 men at work at one time. As they could not work continuously for twenty-four hours, but only for a total of eight hours each man, divided into four-hour watches, it would be necessary to have a crew of 5,400 men alone to man the oars. If six men could develop one horse power, the total horse power developed by the 600 oars handled by 1,800 men would be but 300, as against 3,000 in the Campania, or the same power would require the employment of 186,000 oars and a crew of 558,000 men to manipulate them, which is entirely out of the question."

Additional copies of the lithograph supplement of one of the new Northern line passenger ships which appeared in a recent issue of REVIEW will be sent to any address for 40 cents each. In mailing the picture a tube will be used to protect it from injury.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 110 LaSalle Street.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580.50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

WHEN four surfmen, members of the Cleveland life saving crew, lost their lives a few weeks ago in an attempt to save two young men, who were carried into the lake by a river flood and drowned in the heavy seas, it was thought that a searching investigation would be made regarding the disaster, especially as it was a matter of great surprise that the life saving crew, who were skilled men, and had taken the precaution of putting on their cork jackets, should find the much-talked-of, self-righting and self-bailing life boat of no more use to them, after they had been dumped out of it, than a skiff would be under similar circumstances. As it was admitted that the captain and crew of the Cleveland station were capable men, and had done only that which others in the service may be called upon to do at any time, it would seem that a thorough investigation should deal with the life boat and the causes that made it impossible for the men to hold to the boat after she had been capsized. But the only official report regarding the accident that can be found is far from being satisfactory on this score. On the contrary, it is a collection of glittering phrases about the "swift flowing river" and incoming sea "churned into fury," that sounds more like a ten-year-old school boy's essay than a document that should show a searching investigation into facts upon which the lives of numerous brave men may depend in the future. We refer to the report of Lieut. J. C. Moore of the United States Revenue Marine, the assistant inspector of the life saving service, who was delegated to conduct an investigation in Cleveland regarding the accident, immediately after it occurred. In only one paragraph of his report does this officer refer at all to the efficiency of the life boat. He says: "When half way between the ends of the piers and the breakwater, the stroke oar on the port side broke, and the boat, struck on the starboard bow by a heavy comber, quickly followed by two others, broached to, and in less time than it takes to tell, capsized, and the crew were struggling in the water. The life boat did not right immediately, and then a great wave struck her on the side and she rolled away from the crew. * * * It was impossible for the men to regain the boat, as they were swept away by the strong current, and the boat, floating lightly in the water, was less affected by the current and blown away from them." Notwithstanding the utter uselessness of this life boat in the current and sea spoken of, the conditions were no worse than will prevail often in the future, when men in the service will, in duty to their calling, take the same risks. A tug boat, which was not of extraordinary dimensions or power, went through the same current and sea and saved three other members of the crew, who would have been lost but for the timely assistance thus rendered. Why, then, do the officers of the life saving service seek to cover up defects of the service by proclaiming the great merits of "unsinkable, self-righting and self-bailing" boats. There is a possibility of perfecting a life boat of steam power, or some power greater than that of a few men with oars, and disasters of this kind should be made a basis for agitation of the subject of an improved life boat and legislation that will encourage progress in all life saving appliances.

ON the lakes during the past few years, more attention has probably been given to the work of raising sunken vessels than in any other part of the country, and on this account considerable interest will be shown here in the operations of the wrecking company recently organized in New Jersey to raise the Oregon, which is sunk off Fire island. The company, which is known as the M. Cavanaugh Wrecking Company, is formed to put into practice a method brought to the east by the Grant brothers of Tacoma, Wash. The principle involved in the method to be tried is not new, although some of the appliances may admit of patents being secured. It is proposed to place large rubber bags in the hold of the sunken vessel and connect them by hose with air pumps on floats at the surface. As the bags expand, it is expected that they will expel nearly all of the water from the hold and give the sunken vessel sufficient buoyancy to cause it to rise. A partial trial of this method with canvas bags was made here a few years ago when the steamer Armour was sunk by collision with the Marion at Southeast Bend, St. Clair river.

IN the part of Buffalo known as Black Rock there is an elevator on the Niagara river that is called the Ryan or Erie canal elevator. There is ordinarily 12½ to 13 feet of water in the channel down Niagara river to this elevator, with a current in the rapids of from 8 to 9 miles an hour. This elevator was put in service last season and several cargoes of grain have been shipped there, the cargoes being consigned direct. Some vessel men accept such consignments, not knowing the location of the elevator, but are bound to deliver the grain according to the bill of lading at a good deal of expense, delay and risk.

IF Engineer-in-Chief Melville is right in his conclusions,the smokestack will play an important part in the economics of ship building. Although the New York has proved the fastest naval vessel of her class afloat, he figures that the cruiser Brooklyn, with 800 tons more displacement and practically the same engines, will, on account of an addition of 20 feet in the height of her smokestacks, increase her speed 2 knots an hour. It is expected that the big stacks will at the same time lower the cost of combustion and boiler repairs.

As the time draws near for the great American cup race, interest in the different English and American yachts increases. It is now expected that the American yachts will be in readiness so that the champion on this side may be selected early in September. Lord Dunraven's Valkyrie, one of the English racers, has a sail area of about 10,000 square feet and there is 80 tons of lead on her keel.

Capt. Alex. McDougall's Patents.*

DEAD-LIGHT—SPECIFICATION FORMING PART OF LETTERS PATENT NO. 469,913—DATED MARCH 1, 1892—APPLICATION FILED MAY 22, 1891—SERIAL NO. 393,771—NO MODEL.

This invention relates to an improvement in the means of securing glass dead-lights to iron plates. "It is applicable," says the inventor, "in securing dead-lights to the decks of iron vessels, or to sidewalks or buildings, or in other connections. The principal object is to provide a means whereby dead-lights may be secured easily and firmly in place on metal plates. Another object is to provide a means whereby the dead-lights, which are so placed in position, will be protected from injury by objects dropping on them. Fig. 1 is a top elevation, and Fig. 2 a sectional view.

"A is the plate in which it is desired to secure the dead-lights B In the drawings this plate is intended to represent the top or deck of those vessels which I have invented and which have heretofore been patented by me; but it should be understood that I do not limit the scope of my invention to this particular application, since it may be used in numerous other connections. The plate A is punched or drilled with a number of holes C, which are preferably cylindrical and which should be

Fig 1

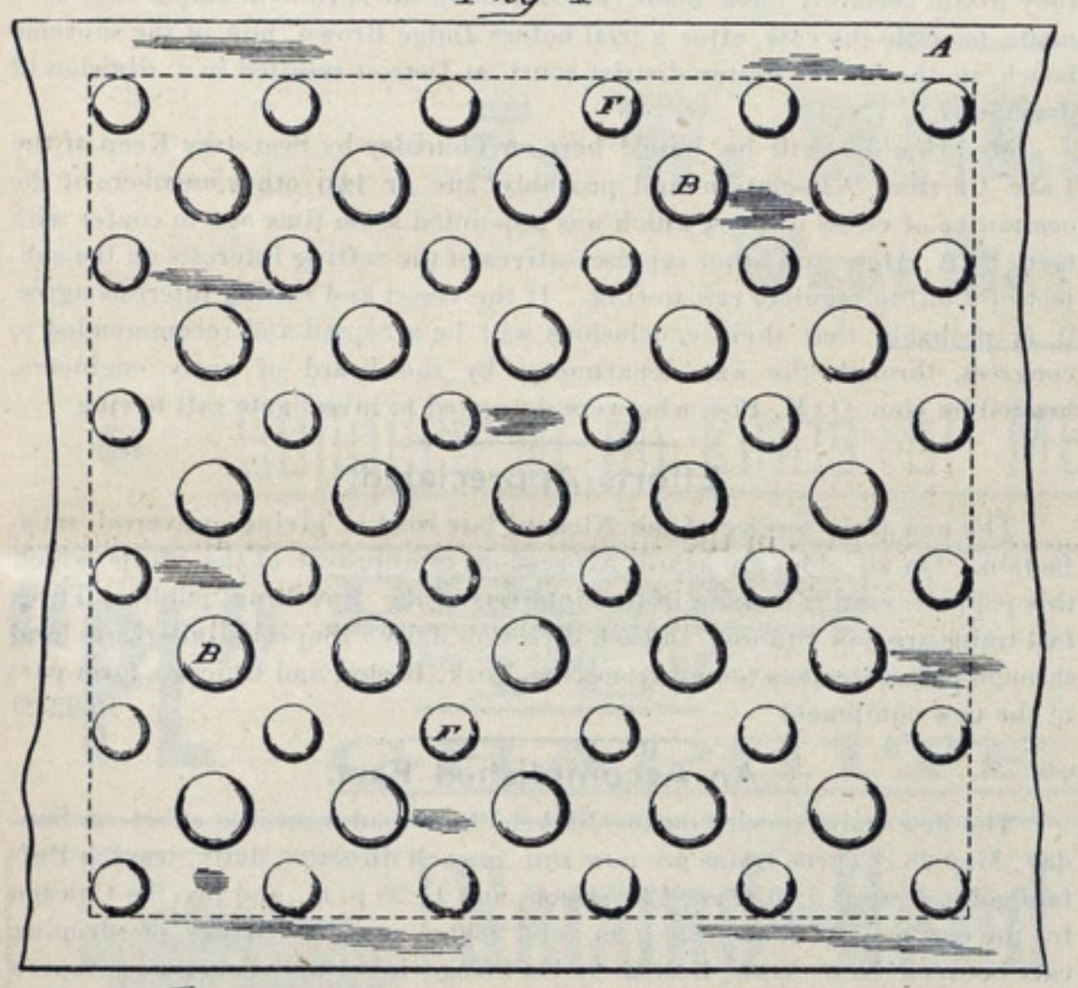
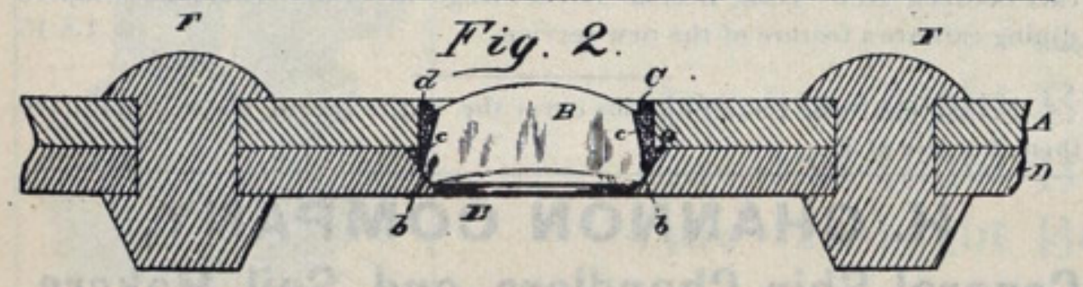


Fig. 2.



about 2 inches in diameter, although, of course, the size thereof is immaterial. Secured to the under side of the plate A is another plate D. The plate D is provided with a number of holes E, which coincide in location with the holes C. The holes E are preferably formed by punching or drilling a cylindrical hole of smaller diameter than C, and then it is reamed outwardly as shown in Fig. 2, so that its upper end will be of larger diameter than the hole C. After the two holes E C have been thus formed, the plate D is secured to the under side of the plate A by means of ordinary rivets F. The upper heads of the rivets F are quite prominent, so as to form a protection for the dead-lights, as will be understood. When the two plates have been secured together, a small shoulder *a* is formed by the bottom of the plate A around the holes C, as will be seen in Fig. 2. Each dead-light B is made slightly convex, so as to properly deflect the light, and should be of a size to enter the holes C. Each dead-light is provided with a small inclined portion *b*, which rests on the inclined sides of the holes E. The sides *c* of each dead-light are inclined slightly as shown in Fig. 2. After the dead-lights have been placed in position in the plates, cement *d* is placed in the hole C, so as to tightly surround the dead-lights. As soon as this cement sets or becomes hardened it will hold the dead-light firmly in position, owing to the fact that the dead-lights are larger at their lower end than at the top. The cement itself will be held in place, owing to the fact that it engages beneath the small shoulders *a a*. The kind of cement which is to be used is to be made, preferably, of brimstone and lamp-black; but it should be understood that any other suitable cement may be used. It should also be understood that the plate D may be bolted on top of the plate A, in which case the holes C should be made in the plate D and the holes E should be made in the plate A. It will be further understood that when the present invention is to be applied to vessels the cement *d* will also perform the additional function of excluding water from around the dead-lights.

"What I claim as new and desire to secure by letters patent is: First—The combination of the plate A, having holes C therein, plate D, having inclined holes E therein, dead-lights B, resting on the inclined sides of the holes E and provided with inclined sides *c c*, and cement *d* for holding said dead-lights in position, substantially as set forth. Second—The combination of the plate A, having holes C therein, the plate D having inclined holes E therein and secured to the plate A, so as to form shoulders *a a*, the dead-lights B, resting on the inclined sides of the holes E and provided with inclined sides *c c*, and the cement *d* for holding the dead-lights in place, substantially as set forth."

*Under this heading we will publish specifications accompanying letters patent granted to Alexander McDougall since his first application for a patent on the whaleback type of vessel May 1, 1880.

Around the Lakes.

Capt. H. Hand, sixty years of age, died at Sandusky last week. He had served as master of several lake vessels.

The steambarge H. E. Runnels was launched Thursday at the yard of the Jenks Ship Building Company, Port Huron. She will go into the lumber trade, and will carry about 700,000 feet.

While in New York, Capt. James Reid had the Protection, which he purchased on the coast, inspected by the United States Standard Register of Shipping. She was granted a certificate giving her an A1 rating for six years, with an insurable valuation of $30,000.

Here are a few samples of big iron ore cargoes, all gross tons and on less than 14½ feet draught, taken out of Two Harbors last week: Mariposa 2,875 tons, Maritana 2,827, Sagamore 2,750, Pathfinder 2,516, Onoko 2,304, Masaba 2,223, Maruba 2,208, Mariska 2,195, Manola 2,193, Marina 2,175, Matoa 2,145, City of Naples 2,132 and Frontenac 2,130.

H. H. Hyman, director of fire service in Cleveland, asks for bids accompanied with plans and specifications for a fire boat of about 80 feet length. Engines must develop 600 horse power and work up to a continuous speed of 175 revolutions, and the boilers are to be of the water tube type. There will be two sets of double fire pumps of the duplex fly-wheel, quarter crank type with steam cylinders 16 inches diameter, and water cylinder 9½ inches diameter, and a common stroke of 12 inches.

Unless present indications are misleading the managers of the World's Fair Steamship Company have made some serious mistakes in planning for the passenger traffic between Chicago and the fair grounds. An announcement that they have been forced to lay up the steamer Arthur Orr, which was chartered at $30,000 for the season, is accompanied by the statement that the cold season is the cause of dullness, but if there was not water enough at the docks for the steamers Palmer and Livingstone, it may be that such a condition has something to do with the Orr going into ordinary.

The first sail vessel that arrived in Chicago was the schooner Tracy in the year 1803 with a man by the name of Dorr as master. This vessel was either owned or chartered by the government, and conveyed Capt. John Whistler, U. S. A., and his command, together with supplies and material for the construction of a fort at the mouth of the Chicago river. He built Fort Dearborn, which was located at the point which is now the corner of Michigan avenue and River street. The steamer Sheldon Thompson and the William Penn were the first steamers that stirred the waters of Chicago harbor and arrived there together on July 8, 1831, having on board Gen. Winfield Scott and soldiers for the Black Hawk war. At this time (eighteen years after Capt. Whistler and his troops first set foot upon Chicago soil) the city of Chicago could boast of only five houses, and three of these were built of logs.—James Whistler Wood of Marshall, Mich., in the Detroit News.

A Great Engineering Problem.

The Lucania and Campania, recently launched, are together equal in cost and extent to one-half of the Forth bridge, and when we consider that these masses had to be slid into the water without strains, or nearly so, the problem as an engineering one far exceeds that of the great bridge. These vessels weighed when launched about 10,000 tons each, and when we consider that two tons to a square foot is a limit of launching load, and that this enormous weight has to be borne on saturated and alluvial earth, the extent of the risk can be imagined. The launching angle is lowered as the weight of vessels increases. In the case of the two vessels named the ways were of oak 4 feet broad. The slope is from three-eighths to five-eighths of an inch per foot, and the velocity aimed at from 9 to 12 feet per second. These ships were built at Govan, near Glasgow, and launched into a river almost wholly an artificial one, made by hand, so to speak. The building foundations laid were made strong and large enough for vessels 700 feet long.—Industries of San Francisco.

Trade Notes.

The lake-built steamer Keweenaw arrived in San Francisco from Panama last week two days ahead of time.

All the steel hull plates for the revenue cutter Windom, being built for duty on the Baltimore station, have successfully passed the required tests and have been accepted from the Carbon Steel Company of Pittsburg, by Second Asst. Engr. McAllister, the inspection officer.

The American Shipmasters' Association of New York, publishers of the Record of American and Foreign Shipping, classed, during the past week, the American three-masted schooners Daisy E. Parkhurst and Harry Messer, American ship Louisiana and Swedish barks Bondina and Maria Adelaide.

On Wednesday of last week, the steel steamer Corsica, which had been in collision on Lake Huron, was docked in Cleveland, and before dark on Saturday, four days later, she was on her way to Escanaba for a cargo of ore. In the meantime, the break in her side, which required three new plates and necessitated the removal of one plate to be straightened, had been thoroughly repaired. The work was done at the ship yard of the Globe Iron Works Company under the direction of Supt. John Smith, who has made a reputation for wonderful work on repair jobs of this kind. The Corsica is owned by people in control of the ship yard, but the rapid work on her repairs is nevertheless remarkable.

One of the most elaborate and interesting catalogues received lately is that issued by the Berlin Iron Bridge Company of East Berlin, Conn. This company has built some of the finest shops connected with the ship and engine building plants of the country, and many views of these works are contained in the book. New boiler shops, machine shops and foundries recently erected for the Detroit Dry Dock Company and S. F. Hodge & Co. of Detroit, and the Lake Erie Engineering Company of Buffalo, are prominent among the illustrations, and there are in addition views of similar works put up for the William Cramp and Sons Ship and Engine Building Company of Philadelphia and the Newport News Ship Building and Dry Dock Company of Newport News, Va. An order just received by this company from the Fuller Iron Works of Providence, R. I., calls for a machine shop 210 feet long and 90 feet wide, with sides entirely of glass, to be built under patents lately granted the Berlin company for construction of this kind.

Detroit Ship Yard Work—Sheffield-North Star Case.

Special Correspondence to the MARINE REVIEW.

DETROIT, MICH., June 15.—Secretary Gilbert N. McMillan of the Detroit troit Dry Dock Company, says that the first of the big steel side-wheel passenger steamers for the Lake Huron division of the Detroit and Cleveland Steam Navigation Company will certainly be ready for service before July 1, and the second boat, upon which work has progressed rapidly since she was launched, will follow within a very short period. The steamer for Capt. E. M. Peck and others is now the only boat under way at the Wyandotte yard of the dry dock company, as it has not been necessary to push operations on the Mathews' steamer (Canadian), which will not go into commission until next spring.

Harvey D. Goulder and Col. Robert Rae, admiralty lawyers, are here in in attendance upon the hearing of the celebrated Sheffield-North Star case, which is having a final hearing in the circuit court of appeals. Although admiralty cases are now heard finally without resort to the supreme court of the United States, by the establishment of this court of appeals, it is not probable that the new court will have many such cases to hear in the future. Underwriters and vessel owners have grown tired of long delays and expensive litigation and have shown their dislike for the courts in a marked degree of late. Take this case for instance. It is now about four years since the Sheffield, a new steel vessel, owned by Harvey H. Brown and others of Cleveland, was sunk on Lake Superior by the North Star, one of the steel vessels of the Northern Steamship Company's fleet. Had the interested parties on either side anticipated the delay and labor in court that has since been encountered, they would certainly have made concessions in the several attempts that were made to settle the case, after a trial before Judge Brown, now of the supreme bench, in the United States district court at Detroit resulted in a division of damages.

Mr. Goulder will be joined here on Thursday by Secretary Keep of the Lake Carriers' Association and probably one or two other members of the committee of vessel owners, which was appointed some time ago to confer with Gen. R. A. Alger and other representatives of the rafting interests on the subject of a bill to regulate raft towing. If the vessel and rafting interests agree, it is probable that their conclusions will be accepted and recommended to congress, through the war department, by the board of army engineers, headed by Gen. O. M. Poe, who were delegated to investigate raft towing.

Efforts Appreciated.

The new train service of the Nickel Plate road is giving universal satisfaction. On all sides are heard expressions of approval of the efforts which this popular road is making in the interests of the travelling public. Three fast trains are now running in each direction daily. Superb dining cars and through palace sleepers to and from New York, Boston and Chicago, form part of the new equipment. 15-22-29

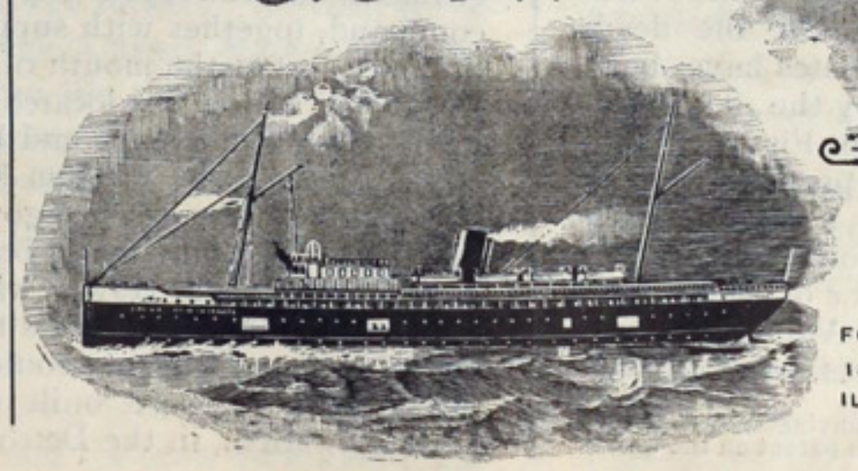
An Accomplished Fact.

The new train service on the Nickel Plate road went into effect on Sunday, May 28. Three trains are now run in each direction daily, leaving Buffalo going west at 5:50 a. m., 12:05 neon, and 11:25 p. m., and leaving Chicago for the east at 7:35 a. m., 2:30 p. m. and 9:30 p. m. No change of sleeping cars between New York, Boston and Chicago in either direction. Superb dining cars are a feature of the new service. 1-8-15

British charts of Lake Superior cover the entire north shore. We have them for sale at $1.

H. CHANNON COMPANY,
General Ship Chandlers and Sail Makers,
Dealers in Manilla Rope, Wire Rope, Tackle Blocks, Cotton Duck, Anchors, Chains, Etc.
24-26 MARKET STREET, CHICAGO, ILL.

TREASURY DEPARTMENT, U S. LIFE Saving Serv ce, Washi gton, D. C., June 2, 1893. Sealed proposals will be received at this office until 2 o'clock P. M of Wednesday, June 21, 1893, for the construction of a life saving station at Ashtabula, Ohio. Forms of proposals together with plans and specifications can be obtained upon applic tion to the Deputy Collector of Customs at Ashtabula, Ohio; to this office; to the Superintendents of Construction, Life Saving Stations, No. 24 State Street, New York City; to the Superintendent 9th Life Saving District, Buffalo, N. Y., a d to the Assistant Inspector, Life Saving Stations, 9th and 10th districts, Detroit, Michigan. S. I. KIMBALL, General Superintendent. 8 15

E. S. Richardson Fueling Co.

COAL
DOCKS
FOOT NO. MARKET ST
18TH ST. BRIDGE,
ILLINOIS CENTRAL SLIP "C"
OFFICE. 54 LA SALLE ST.
CHICAGO ILL.

MARINE VALVE OIL

For Cylinder Lubrication is unsurpassed, and is used in 90 per cent. of the large steamers on the great chain of lakes.

Marine Valve, Eldorado Engine, Victor Signal, Mineral Seal,
Renown Engine, Crank Case, Dark Lubricating, Head Light,
Artic Cup Greases, and Lard Oils.

— CARRIED IN STOCK AT THE —

Standard Oil Company's Marine Depot

123 River Street, CLEVELAND, O.

TELEPHONE 77. MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE BY

STANDARD OIL COMPANY,

No. 5 Wabash Ave., Chicago, Ill.
Racine, Wis.
Broadway & Mason, Milwaukee, Wis.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.
Marinette, Wis.
Oshkosh, Wis,
Duluth, Minn,
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.
Sault Ste. Marie, Mich.
Michigan Central Railway & 10th St., West Bay City, Mich.
Eighth & Sears Sts., Saginaw, Mich.
46 Jefferson, Detroit, Mich.
Summit & Monroe Sts, Toledo, O.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.
STANDARD OIL COMPANY, Star Oil Works, Buffalo. N.Y.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.
A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O.

F. W. WHEELER, President.
E. T. CARRINGTON, Vice-President.
F. L. GILBERT, Secretary.

F. W. WHEELER & CO.,

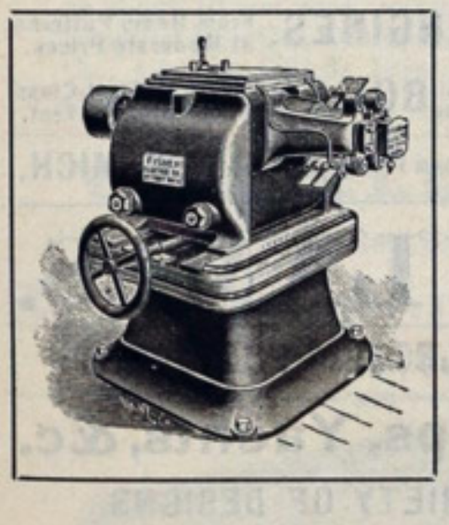
WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

"PL" DIXON'S "PL" GRAPHITE.

Dixon's Perfect Lubricating Graphite is indispensible to every engineer and machinst. It can be used dry or mixed with water, oil or grease. We send free of charge a sample and pamphlet with interesting and instructive information.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.



Second-Hand Lighting Plants for Sale.

One 300-Light Brush Dynamo,
One 150-Light Brush Dynamo,
One 125-Light Brush Dynamo,
} REMOVED FROM STEAMERS CITY OF CLEVELAND AND CITY OF DETROIT.

One 125-Light United States Dynamo, Removed from Steamer Castalia.
One 300-Light United States Dynamo, Removed from Steamer Tuscarora.
One 125-Light Thomas-Houston Dynamo, Removed from Yacht Wadena.

Fisher Electric Company, Detroit, Mich.

"Nothing Succeeds Like Success."

The United States Metallic Packings

FOR

Piston Rods and Valve Stems.

After Years of Service it Still Excels ALL Others. In use ON MOST ALL THE LARGE STEAMERS ON THE LAKES.

WRITE US FOR CATALOGUE.

GEO. P. WILSON, Gen'l Agt., 435 North Broad St., Philadelphia, Pa.
614 Rialto Building, Chicago, Ill.

WILLIAM L. BROWN, PRESIDENT. W. F. COBB, VICE-PRESIDENT. W. I. BABCOCK, MANAGER. O. R. SINCLAIR, SECRETARY.

CHICAGO SHIP BUILDING COMPANY,

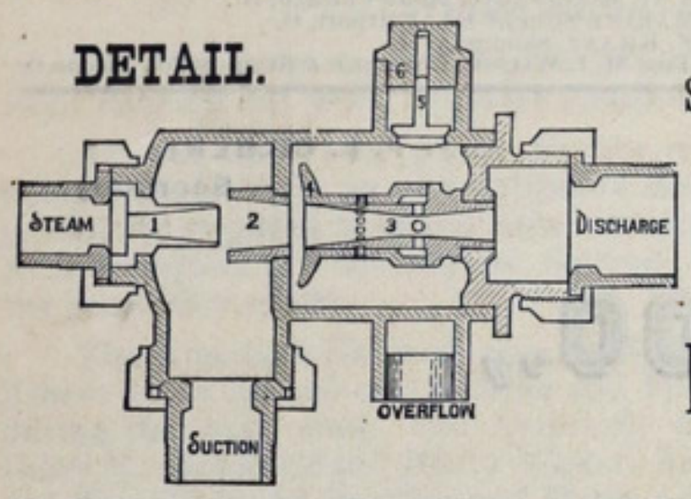
STEEL STEAM-SHIP BUILDERS,

TELEPHONE No. 40. (South Chicago Exchange.)

101st St. and Calumet River, COLEHOUR, ILL.

The Globe Automatic Injector.

DETAIL.



See the SIMPLICITY OF IT!

SUPERIOR FOR MARINE BOILERS.

Write for Particulars.

Eagle Lubricator Co.

MANUFACTURERS,

108 Canal St., - Cleveland, O.

A NEAT TRICK.

OWNER—Captain, do you want to see a neat trick explained?
CAPTAIN—Yes sir, what is it?
OWNER—Here is a circular explaining CRAWLEY & JOHNSTON'S "Cincinnati" Automatic Steam Steerer.
CAPTAIN—(After a careful study.) That's the best and simplest I ever saw. "Its a corker." Put one of them on my boat and I'll show you some quick work and save the price of it in a few trips.
OWNER—I'll do it, and adv'se my friends to invest'gate it.—Write for prices, etc.

CRAWLEY & JOHNSTON, 119-121-125 East Pearl St., CINCINNATI, O.

GEORGE B. CARPENTER. ESTABLISHED 1840. BENJAMIN CARPENTER.

GEO. B. CARPENTER & CO.

Ship Chandlers and Sail Makers.

CORDAGE, TWINES, COTTON DUCK,
MILL, RAILROAD and VESSEL SUPPLIES.

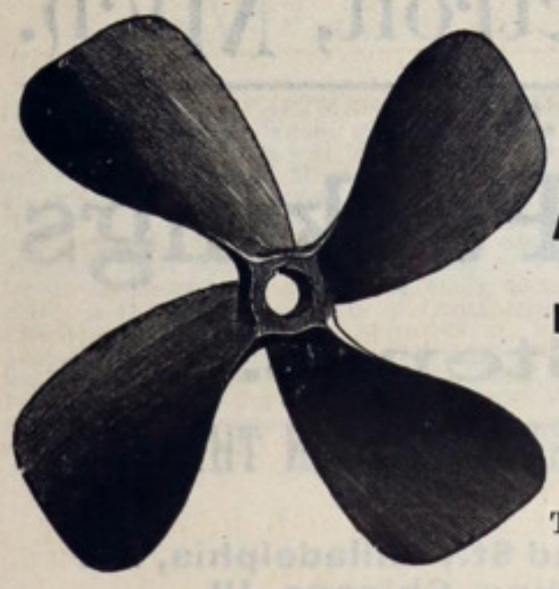
202, 204, 206, 208 So. WATER STREET,
CHICAGO, ILL.

H. G. TROUT
KING IRON WORKS,

BUFFALO, N. Y.,

MANUFACTURERS OF

TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,



High and Low Pressure Engines,
Sectional, Propeller,
Tug and Yacht Wheels.

Cowles Aluminum and Manganese Bronze Propeller Wheels.

These Wheels are noted for their extra speed, towing power and proportionate saving of coal.

PRICES QUOTED ON APPLICATION.

THE JENKS SHIP BUILDING CO.

Will have FOR SALE OR CHARTER by the begining of navigation, 1893,

THREE (3) STEAMERS

Especially Designed for the Lumber Trade.

If interested, address them at PORT HURON, MICH.

C. H. McCUTCHEON,

(Successor to SAMUEL McCUTCHEON.)

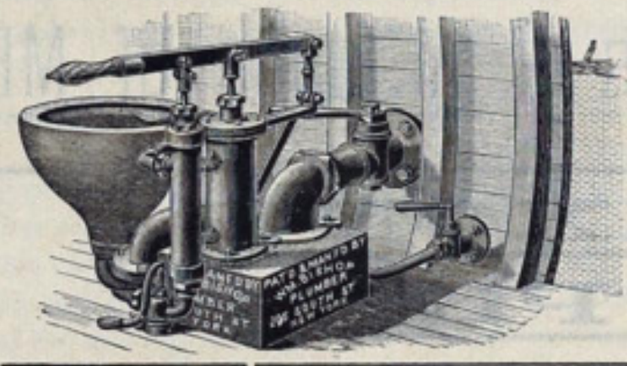
Copper, Tin and Sheet Iron Manufactory,

Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68. No. 18 Ohio Street BUFFALO, N. Y.

COMBINATION PUMP WATER CLOSET

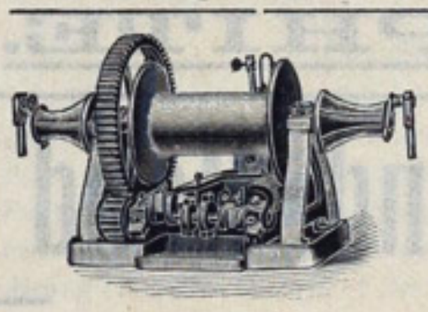


For Yachts, Pilot Boats, Naval Ships, Etc.

For above or below water line. No tank needed, and when below water line you can flush bowl without having to use pump.

WILLIAM BISHOP,
Plumber, Coppersmith & Steam Fitter,
Telephone 4811 Cortlandt,
205 South Street, NEW YORK.

Yacht Fittings a Specialty.



JNO. L. JACKSON,

Builder of DUPLEX HOISTING AND DECK ENGINES.

Plain Finished and Automatic **ENGINES**, From Heavy Patterns at Moderate Prices.

Vertical, Horizontal, Marine & Locomotive **BOILERS** Strictly First-Class and Highest Test.

Send for Circulars and Prices. SAGINAW, MICH.

SHIP LAMPS.

OIL AND ELECTRIC FIXTURERS

FOR

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.

PAGE BROS. & CO.,

(Formerly WILLIAMS, PAGE & CO.)

227 to 233 Cambridge St., BOSTON, MASS.

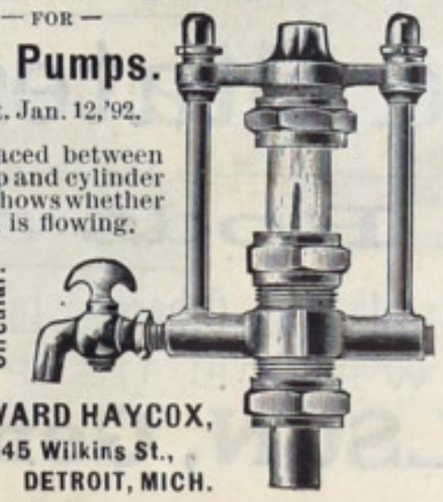
Haycox Sight Connection

— FOR —

Oil Pumps.

Pat. Jan. 12,'92.

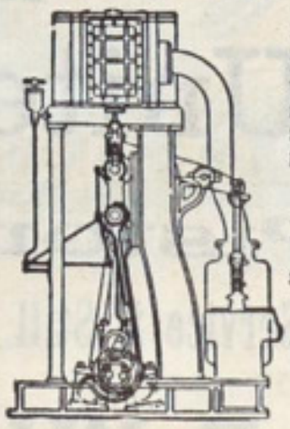
Is placed between pump and cylinder and shows whether oil is flowing.



Write for Prices and Circular.

EDWARD HAYCOX,
145 Wilkins St.,
DETROIT, MICH.

THE O'CONNELL GREASER,



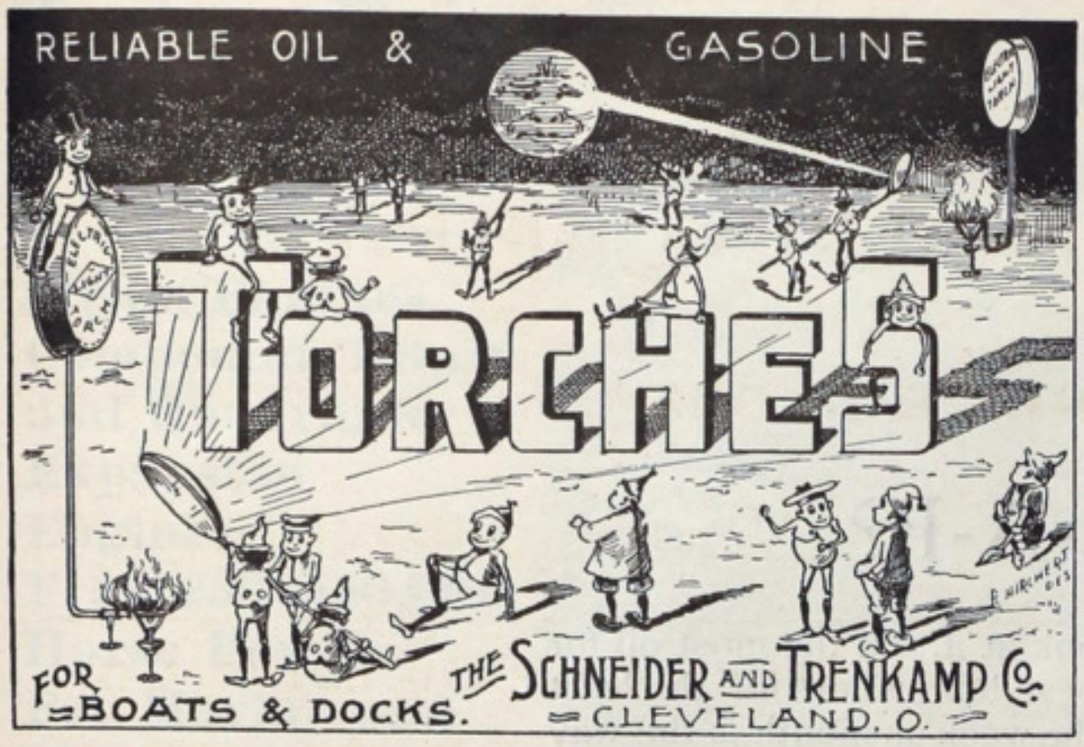
During the past three years hundreds of marine engines of from 2,000 to 4,000 h. p. have been served, as well as high speed electric light engines.

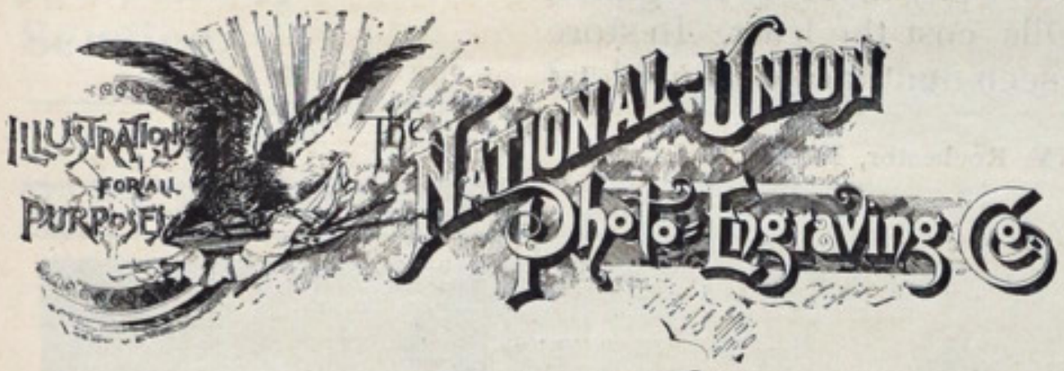
RESULTS:

Sure control of Crank Pin.
Stoppage of Lard Oil account.
Perfectly clean Engine

Wadhams Oil & Grease Co.
Sole Manufacturers.
MILWAUKEE, WIS.

☞ Write for Catalogue and Prices of Cup and Greaser Grease.





Photographs and Drawings reproduced for all kinds of Printing.

Cleveland, O.

1880. 1893.

CHAS. H. POTTER & CO.,

Investment Bankers,

Cleveland, O.

Dealers in

Lake Superior Iron Mining Stocks,

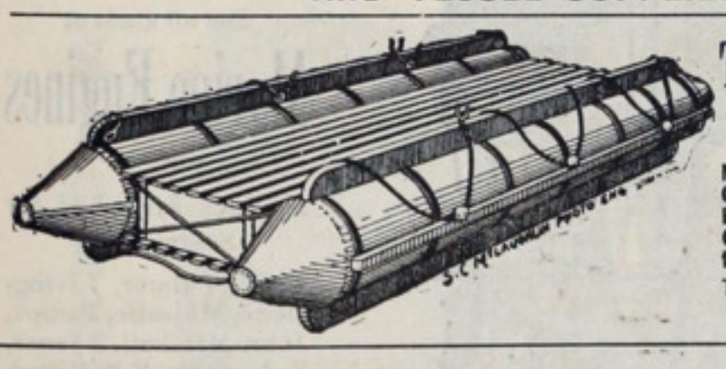
on about 10 per cent. annual dividend basis, Republic Iron Co., Lake Superior Iron Co., Champion Iron Co., Minnesota Iron Co., Jackson Iron Co., Cleveland-Cliffs Iron Co., Chandler Iron Co., Chicago and Minnesota Ore Co.

CONNELLY BROS. & CO.

OHIO, Cor. Michigan St., BUFFALO, N. Y.

SHIP CHANDLERY, PAINTS, OILS,

AND VESSEL SUPPLIES.



Thos. Drein & Son,

BUILDERS OF

Metallic Life Boats and Rafts, Government and Pleasure Boats. Block and Granulated Cork Life Preservers. Outfit for Lake Steamers a Specialty.

TATNALL & RAILROAD STS.

Wilmington, Del.

ERIE RUBBER CO.

ERIE, PA.

Manufacturers of the

KEYSTONE MARINE VALVE

THESE

RED RUBBER VALVES

ARE THE

BEST AIR & FOOT VALVES MADE.

IF YOUR DEALER DOES NOT KEEP THEM, WRITE DIRECT TO THE FACTORY.

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

Our DREDGE and CRANE CHAINS are made of IRON ROLLED SPECIALLY for that purpose. Send for Price List

J. B. CARR & CO., Manufacturers, TROY, NEW YORK.

YACHTING!

GO TO THE WORLD'S FAIR WITH YOUR YACHT'S CREW UNIFORMED

BY

FRANK G. OVERBEKE,

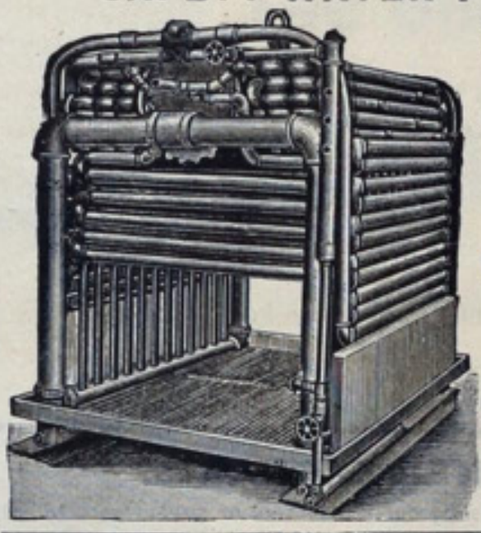
TAILOR AND OUTFITTER,

FINELY ILLUSTRATED CATALOGUE ON APPLICATION.

112 Woodland Ave., CLEVELAND, O.

THE ROBERTS

SAFETY WATER TUBE MARINE BOILER,



For Yachts, Launches and other Steamers.

THE ORIGINAL FIXED WATER LINE PIPE BOILER.

"Imitation the Sincerest Flattery." We are collecting royalties from the customers of many infringers.

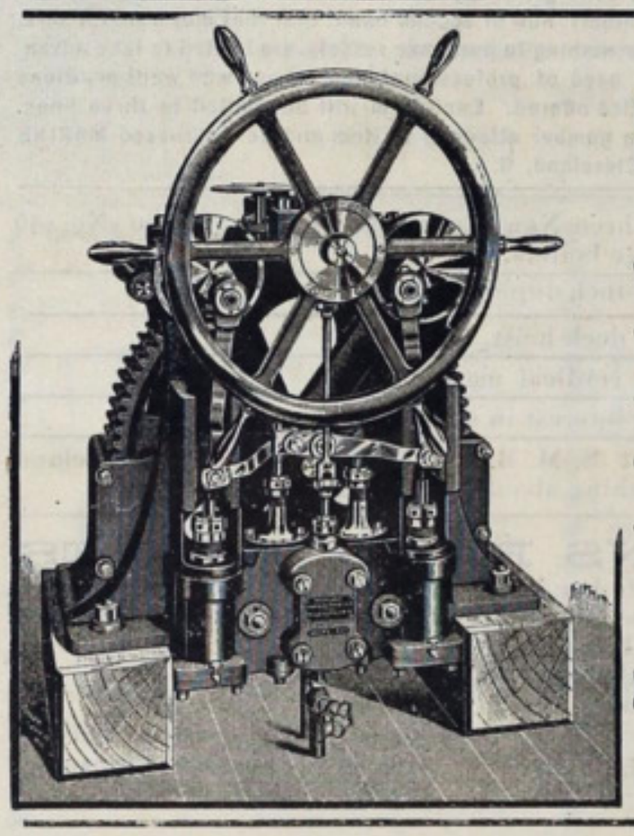
OVER 500 IN USE.

☞ SAFE, RELIABLE, SIMPLE, LIGHT WEIGHT, ECONOMICAL, NO SHOP REPAIRS, SMALL SPACE. Send for Illustrated Pamphlet and other reading matter, with hundreds of enthusiastic letters from purchasers and engineers.

The Roberts Safety Water Tube Boiler Co.

Works covering 12,000 sq. ft. of ground at RED BANK, N. J.

18 Cortlandt Street, NEW YORK CITY.



No. 4 BECK Steam Steering Gear.

Extracts from Letters.

"THE steering gears of the lakes."
Capt. Higgie, V. O. T. Co., Chicago.

"Cannot be excelled."
Capt. Cochran, Steamer Marion.

"Gives entire satisfaction."
Independent Tug Line, Chicago.

"Are giving excellent satisfaction."
Milwaukee Dredge Co.

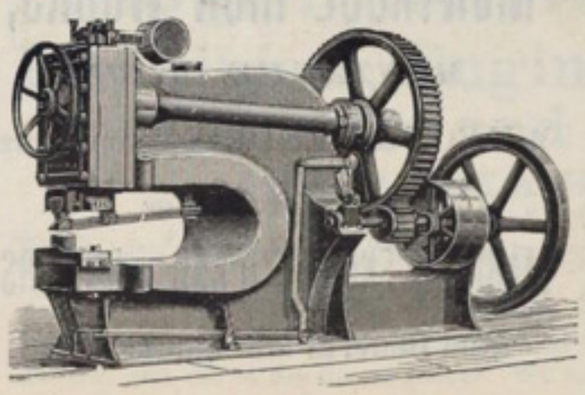
"The No. 4 Beck Steering Gear put in our steamer, Samuel Mather, has given excellent satisfaction."
W. L. Mahon, Mech'l Eng'r, American Steel Barge Co.

PAWLING & HARNISCHFEGER,

156-168 Clinton Street,

MILWAUKEE, WIS.

The Excelsior Machine and Cleveland Punch and Shear Works Co.



SUCCESSORS TO

LEIGHTON & HATHAWAY.

Manufacturers of

Punches, Shears, Bending Rolls, Rotary Planers, Overhead & Post Drill Presses.

980 to 986 Hamilton St.,

CLEVELAND, OHIO.

C-H-E-A-P?

Depends upon how you look at it. If the most oil for the least money, no. If the best lubrication for the least cost, yes. What oil costs by the week or month is the way to figure, not by the gallon. Better pay more by the gallon and less by the day. Vacuum Oils cost the least. In store at all marine ports. Have you seen our marine pamphlet?

VACUUM OIL COMPANY, Rochester, N. Y.

MARINE REVIEW LINER EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind or wishing to purchase vessels, are invited to take advantage of the same offer. Employers in need of professional men or men who want positions may avail themselves of the opportunities offered. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 516 Perry-Payne Building, Cleveland, O.

205—FOR SALE CHEAP—Three New Columbia Injectors—Two No. 40 and One No. 35, suitable for large boilers.

206—FOR SALE—5¼ by 3 x 6-inch duplex pump.

207—FOR SALE—6 by 8-inch deck hoist.

208—FOR SALE—6 by 8-inch verdical marine engine.

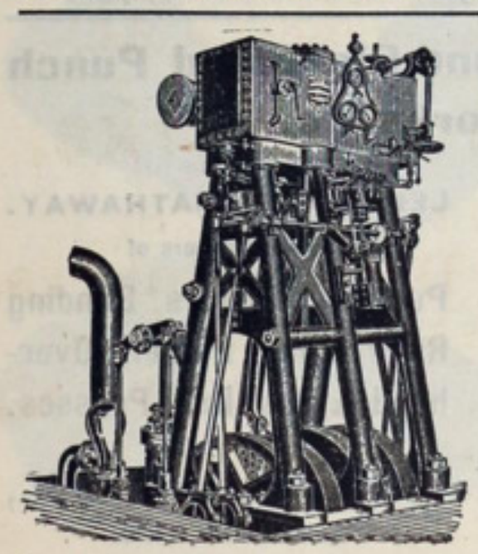
209—FOR SALE—Two-thirds interest in a 500 ton B1 schooner.

210—FOR SALE—Supply boat F. M. B. A. Now in service in Cleveland harbor. Boat is new and everything about her has been well cared for.

JENKINS BROS.' VALVES

Every valve tested and warranted, all parts interchangeable.
Nothing but best Steam Metal used in the manufacture.
Keyed Stuffing Box and Disc Removing Lock Nut
Is used only in the Jenkins Bros.' Valves.
None are genuine unless stamped with "Trade Mark."
Should you order, INSIST on having Jenkins Bros.' Valves.

71 JOHN STREET, NEW YORK. 31 & 33 N. CANAL ST., CHICAGO.
21 NORTH FIFTH ST., PHILA. 105 MILK STREET, BOSTON.



J. D. WILSON. M. HENDRIE.

MONTAGUE IRON WORKS,

MONTAGUE, MICH.

WILSON & HENDRIE, Proprietors.

MANUFACTURERS OF

MARINE :: ENGINES :: AND :: BOILERS,

and General Mill Machinery.

P. M. CHURCH & CO.,

SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH.

LEADING DEALERS IN

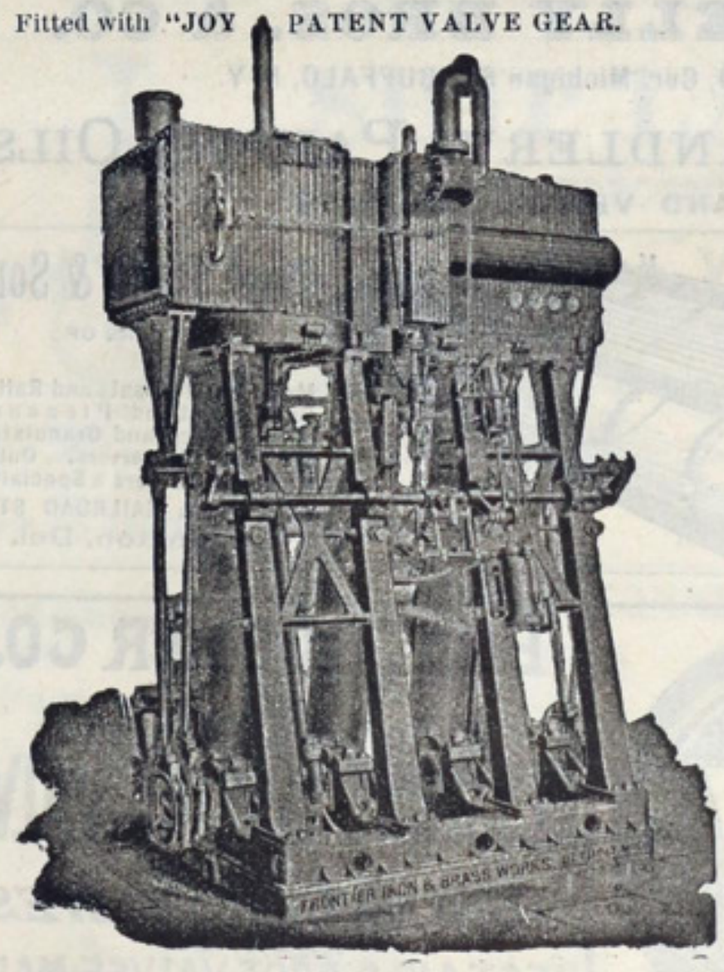
Ship Chandlery,

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

THE FRONTIER IRON WORKS.

Fitted with "JOY" PATENT VALVE GEAR.



DETROIT, MICH.,

Builders of

TRIPLE EXPANSION

and all kinds of

Marine Engines

Engines furnished for Steamships:

T. W. Palmer, Livingstone, Majestic, Tampa, John Mitchell, Nyanza, Fedora, Geo. F. Williams, Mackinaw, Keweenaw, Jno. Harper, W. F. Sauber and Iosco.
Panther, (fore and compound).
Uganda, W. H. Gilbert, C. F. Bielman.

WHALEBACKS—
Samuel Mather, Pathfinder.

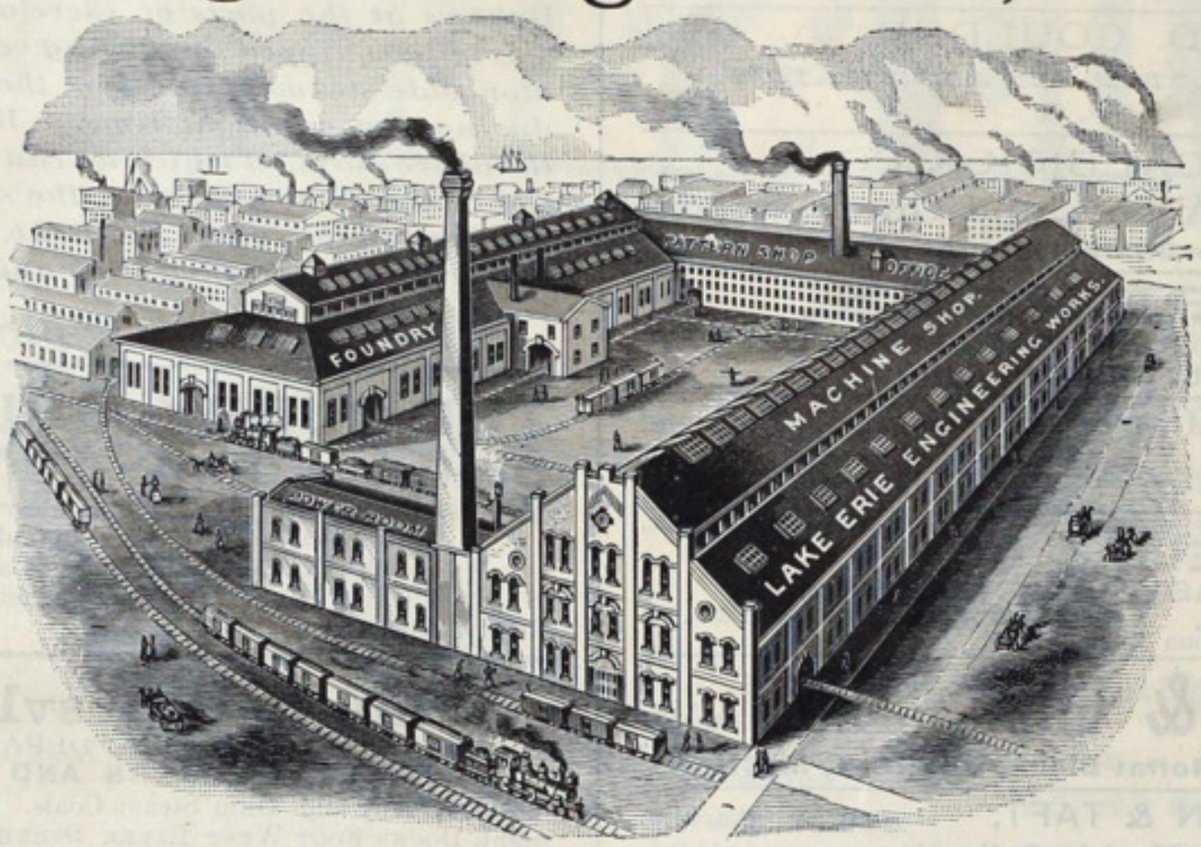
CORRECTED CHARTS OF THE ST. MARY'S RIVER CAN BE HAD FROM THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

Lake Erie Engineering Works, Buffalo, N. Y.

RICHARD HAMMOND, Pres't.

JOHN COON, Sec'y and Treas.

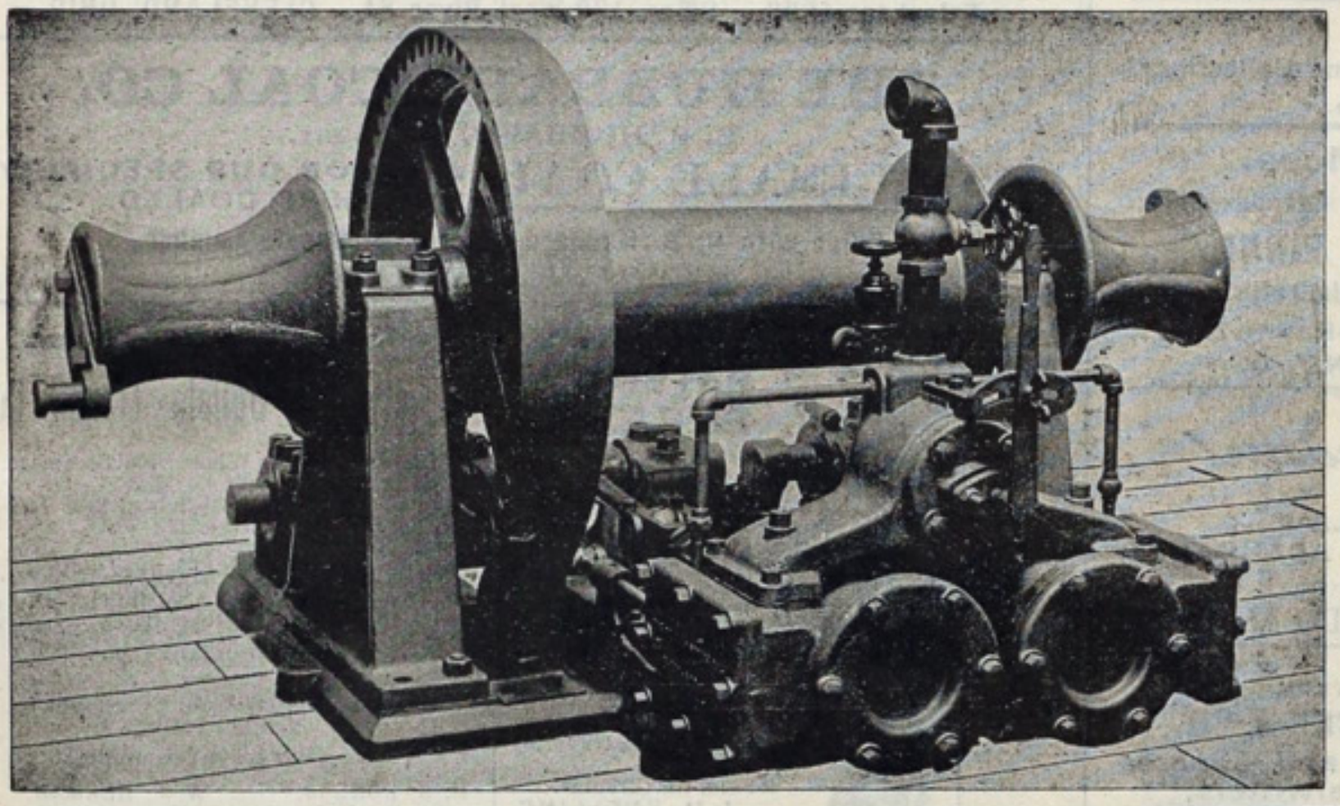
Steam Engines, Compound, Triple and Quadruple Expansion Engines, From 250 to 10,000 Horse Power For Marine and Stationary Service.



Special Designs for Cable Railways and Electric Power Plants.

The Best Economy and Regulation Guaranteed.

THE BEST EQUIPPED PLANT IN AMERICA.



The Chase Machine Co.

111 Elm St., CLEVELAND, O.,

Machinists and Engineers,

Manufacturers of

Land and Marine Engines and Steam Pumps,

Sole Owners and Manufacturers of the

Chase Fog Whistle Machine.

Over 150 in use on the best class of Lake Steamers.

Special Attention given to Marine Repair Work.

ENGINEERS' SUPPLIES.

ASBESTOS PIPE AND BOILER COVERING.

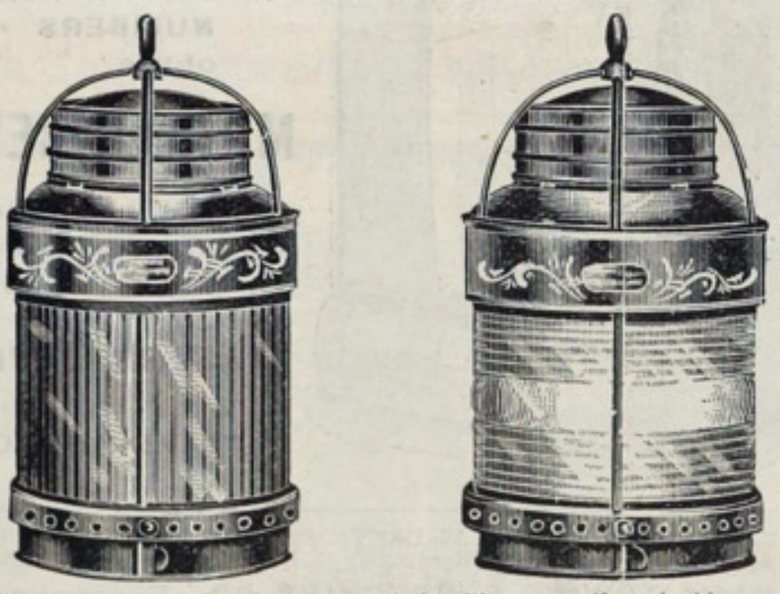
Telephone 994

McBEAN, EDGE & CO..

Steamboat Sheet Iron, Tin and Copper Workers,

—MANUFACTURERS OF—

SIGNAL LAMPS



With patent lenses, fluted or corrugated, with corrugations inside or out.

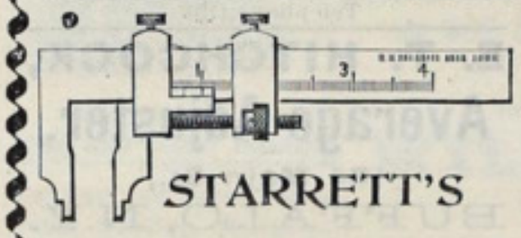
STEEL RANGES for Steamboats and Hotels.

HEAD LIGHTS, ENGINEERS' SUPPLIES,

Anchor and Binnacle Lamps; Square, Triangle and Canalboat Head-lights; Torches Coal Oil Lamps, Lanterns, Chimneys, Wicks, &c.

Telephone 803. 33 Main St., BUFFALO, N.Y.

☞SEND YOUR ORDER FOR "PATTERSON'S NAUTICAL DICTIONARY" ($5) TO THE "MARINE REVIEW" AT ONCE.



STARRETT'S

Fine Tools

Warranted Accurate—Best in Workmanship—Latest in design—Finest in Finish—Send for Catalogue.

L. S. STARRETT,
Athol, Mass., U. S. A.

KLING BROS.

BOAT BUILDERS

Hulls Iron or Steel up to 150 ft. in length.

BOILER WORKS.

Dock 287 Hawthorne Av.

CHICAGO, ILL.

Mc Kinnon Iron Works,

Machinists, Engine Builders, Shipsmiths and Boiler Makers.

ASHTABULA HARBOR, O.

—DEALERS IN—

Engineers' Supplies, Lubricating and Burning Oils, Steam, Deck and Suction Hose, and Air Pump Valves.

We carry Largest Stock of these goods to be found between Cleveland and Buffalo, and sell at the lowest price. We solicit your trade while at this port.

SHERMAN, HOYT & DUSTIN,
LAWYERS AND PROCTORS IN ADMIRALTY.
Western Reserve Building, Room 701 to 706, CLEVELAND, O.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

W. H. COOK.
CAPT. J. A. CALBICK.
J. B. CLOUGH.
COOK, CALBICK & CO.
Vessel Agents and Underwriters.
Tel., Main, 56. RIALTO BLDG., No. 23 Sherman St., CHICAGO, ILL.

H. R. SPENCER,
ATTORNEY AT LAW and PROCTOR IN ADMIRALTY.
218 Superior St., DULUTH, MINN.

C. E. KREMER, *Attorney and Counselor-at-Law and Proctorin Admiralty.*
Rooms 14, 15 and 16, Bryan Block, - - 164 LA SALLE ST., CHICAGO. ILL.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO.
Office Telephone, 737. Reidence, John Mitchell, 3506.

WM. A. MOORE.
WM. V. MOORE.
JOHN H. GOFF.
MOORES & GOFF, Proctors in Admiralty
Telephone 2565. 60-61 Moffat Block, DETROIT, MICH.

H. C. MASON. MASON & TAFT, F. L. TAFT.
ATTORNEYS-AT-LAW, Marine Collections a specialty.
218 Society for Savings Bldg., Cleveland, O.
TELEPHONE 876.

WM. H. MILLER,
ATTORNEY AND PROCTOR IN ADMIRALTY. Marine Collections.
626 Society for Savings Bldg., Cleveland, Ohio.

JOHN PRINDIVILLE,
Vessel and Insurance Agent,
12 Sherman Street,
CHICAGO, ILL.
Telephone, Main, 129.

C. A. Macdonald. J. J. Rardon.
C. A. MACDONALD & CO.
General Insurance Agents,
RIALTO BUILDING, CHICAGO, ILL

H. S. LORD. J. H. NORTON.
LORD & NORTON,
Attorneys-at-Law, Proctors and Advocates in Admiralty,
DULUTH, MINN.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. Chas. Hutchinson.
P. J. Minch.
PALMER & CO.,
Vessel Owners and Agents,
(John H. Palmer and Jonn T. Hutchinson, Associates.)
Perry-Payne Bldg., Cleveland, O.

W. A. HAWGOOD. C. C. CANFIELD.
HAWGOOD & CANFIELD,
Vessel Agents and Marine Insurance,
604-605 Perry-Payne Bldg.,
Cleveland, - Ohio.
Telephone No. 2395.

Capt. LYMAN HUNT. JAMES P. HUNT.
L. HUNT & SON,
Vessel Brokerage & Marine Insurance,
Room 9, Exchange Building.
Telephone No. 522.
No. 202 Main St., BUFFALO, N.Y.

Law Offices.
Notary Public and Stenographer.
ORESTES C. PINNEY,
Proctor in Admiralty,
521 & 522 Perry-Payne Bldg.,
CLEVELAND, O.

W. L. Windom.
ATTORNEY-AT-LAW AND PROCTOR IN ADMIRALTY
Marine Notary.
ASHLAND, WIS.

C. W. ELPHICKE. A. L. FITCH.
JAS. A. MYERS.
C. W. ELPHICKE & CO.,
Vessel Owners and Agents,
Marine Underwriters,
Rooms 10, 11 and 12, Wheeler Block, 6 and 8 Sherman St. CHICAGO.
Telephone 1194.

E. T. HITCHCOCK,
Average Adjuster,
184 Main St.,
BUFFALO, N.Y.

Moore, Bartow & Gilchrist,
Ship Brokers & Agents,
Nos, 611 & 612 Perry-Payne Building,
Superior Street, Cleveland, O.

H. J. WEBB & CO.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co. will charter vessels for the lake trade. Special attention given to chartering vessels in the Lake Superior Iron Ore trade, both for the season and single trip.
No. 606 & 607 Perry-Payne Building, Cleveland, O. Office Telephone No. 338, Residence No 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers, and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

Established 1857.
THOMAS MARKS & CO.,
Merchants,
Forwarders and Shipowners,
Port Arthur, Canada.
N. B.—Special attention given to chartering vessels.

To Owners and Masters of Steam Barges.

—:o:—

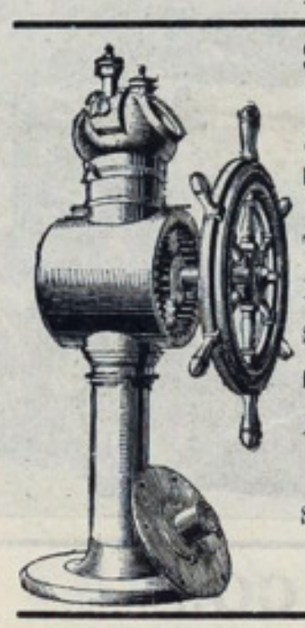
We beg to call your attention to the fact that we have steam lighters at the ports of Cleveland, Ashtabula and Buffalo, specially equipped for fueling vessels, which enable us to run alongside steamers and fuel them while they are unloading during day or night time. We also have fueling docks at the above ports, at which we can take care of vessels not desiring to avail themselves of the services of the steam lighters. We shall in the future, as in the past, handle nothing but the best grade of Pittsburg coal, and respectfully solicit your patronage.

PICKANDS, MATHER & CO.

THE CUDDY-MULLEN COAL CO.,
Dealers in COAL.
Docks at Government Pier, Whiskey Island, and Adjoining Globe Dry Dock.
All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, O. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg,

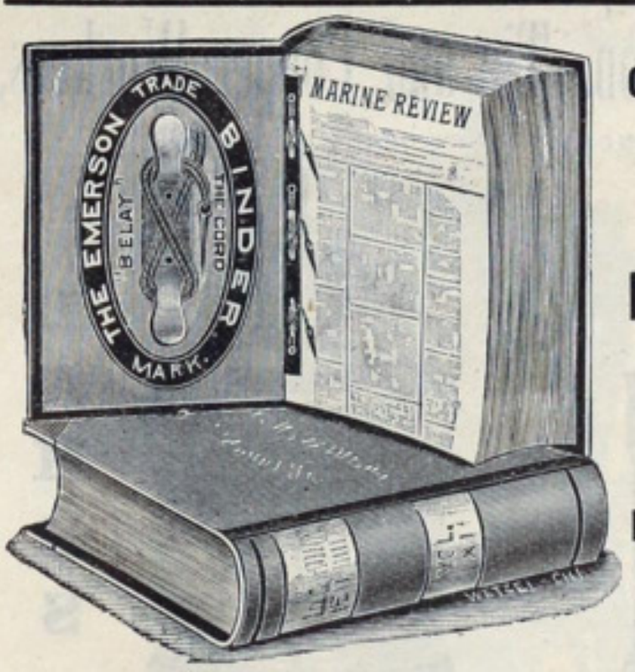
Ohio & Pennsylvania Coal Co.
FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

THE HUBBARD COAL CO.
S. B. HUBBARD, Manager.
WHOLESALE COAL. JACKSON OUR SPECIALTY. STEAMERS COALED.
Office with R. B. Hubbard & Son, Wholesale Lumber,
SANDUSKY, OHIO.



SNELLING'S PATENT STEERER
For Steamers, Ships, Tugs, Yachts, Coal Barges, Etc.
The drum has powerful internal gearing.
No PURCHASE BLOCKS needed.
Simple as the common "wheel and drum."
Powerful as any Screw Steerer.
An excellent relief or auxiliary gear for vessels that steer by steam.
Send for Circular.
J. H. SNELLING,
158 South Street,
NEW YORK.

"Cleveland to Buffalo while you sleep."
Cleveland & Buffalo Transit Co.
Magnificent Side Wheel Steel Steamers.
"State of Ohio," and "State of New York."
DAILY TIME TABLE. (Sundays included.)
L've Cleve., 7:15 P.M. | L've Buff., 7:45 P.M.
Ar. Buffalo, 7:30 A.M. | Ar. Cleve., 8:00 A.M.
(Central Standard Time.)
Special Saturday Night Excursions to Niagara Falls.
Write for our tourist pamphlet.
H. R. ROGERS, Gen'l Pass. Agt. W. F. HERMAN, Gen'l Agt.
T. F. NEWMAN, Gen'l Mgr., Cleveland.



ONE OF THESE BINDERS
that will hold 52 NUMBERS of the
MARINE REVIEW,
Will be mailed to any address on receipt of $1.
MARINE REVIEW...
516 Perry-Payne Bldg.,
CLEVELAND, O.

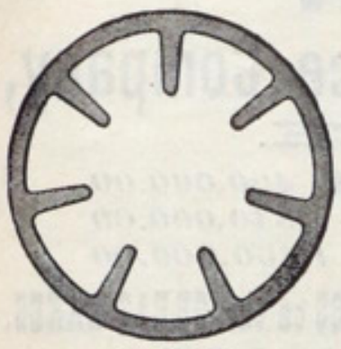
H. A. BARR, PRESIDENT, Escanaba. F. H. VAN CLEVE, SEC. Escanaba. CAPT. GEO. BARTLEY, SUPT. Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch. Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction.

MECHANICAL DRAWING Taught by Mail,
Also, MECHANICS, *Mining, Prospecting, Arithmetic, etc.* To begin, students only need know how to read and write. DIPLOMAS Awarded. Low Prices. Send for FREE Circular to The Correspondence School of Mechanics, Scranton, Pa.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

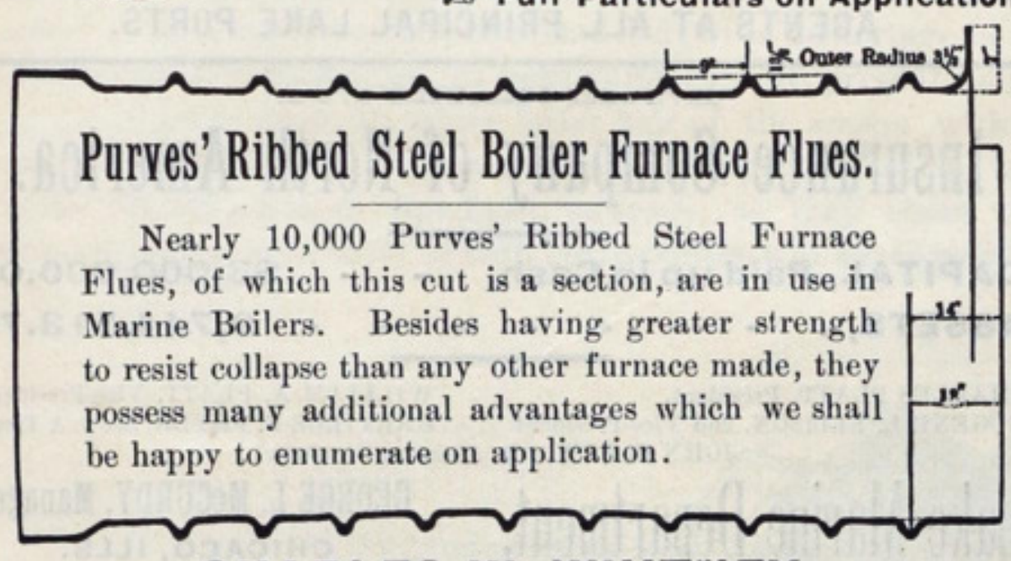
320 ATWATER STREET,
DETROIT, MICH.



SERVE'S RIBBED STEEL
BOILER AND STAY TUBES

Show an average economy in fuel of 15 per cent. In steamers this means not only so much saving in cost of coal, but additional freight capacity.

☞ Full Particulars on Application.



Purves' Ribbed Steel Boiler Furnace Flues.

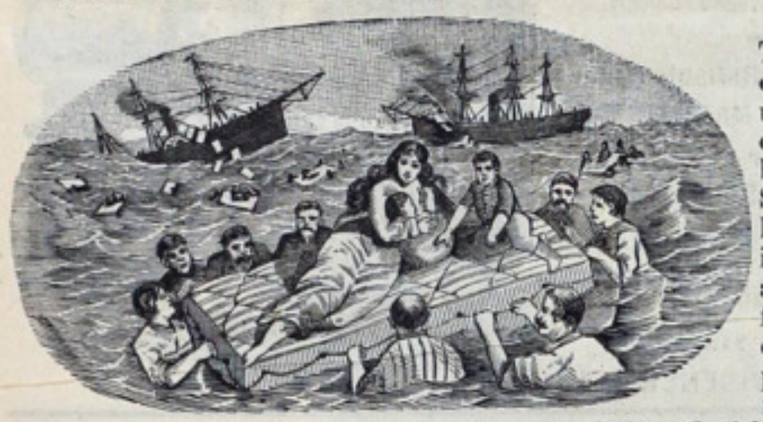
Nearly 10,000 Purves' Ribbed Steel Furnace Flues, of which this cut is a section, are in use in Marine Boilers. Besides having greater strength to resist collapse than any other furnace made, they possess many additional advantages which we shall be happy to enumerate on application.

CHARLES W. WHITNEY,

Representing Messrs. JOHN WILLIAMS & CO., Liverpool, sole agents for the U. S. and Canada.

81 and 83 FULTON STREET, NEW YORK.

LIFE-SAVING MATTRESSES.



THE ONLY MATTRESS made that is essential for steamship use; fitted with life-cords, each mattress becomes a LIFE PRESERVER and will hold up twenty persons in the water. They are also especially adapted for Steamships, Yachts, etc., as they are always pure and clean, never need renovating, will not absorb moisture and cannot become infected with the germs of any contagious disease. Furthermore, they make the most comfortable bed in existence. Be sure you have your new vessels fitted entire with our goods. Write for catalogue and testimonial letters.

IMPORTANT.—We have just received official notice from the U.S. Government, that ships having our AIR MATTRESSES can carry so many less Life Preservers. Manufactured and sold only by

METROPOLITAN AIR GOODS CO., 7 Temple Place, Boston, Mass.

HORACE SEE,
CONSULTING ENGINEER AND NAVAL ARCHITECT,
ONE BROADWAY, NEW YORK.

THE CONDIT FULLER CO.

CLEVELAND, OHIO.

BAR IRON, SHEET IRON, PLATE IRON, PIG IRON,
BOILER RIVETS,
BOILER TUBES, PLATE STEEL,
GAS PIPE, BOAT SPIKES,
CLINCH RINGS, STEEL NAILS.

Sales Agents of

THE CARBON STEEL CO.

Manufacturers of
OPEN HEARTH STEEL,
SHIP PLATES, BOILER PLATES,
ARCHES and STRAPS FOR VESSELS A SPECIALTY.

Write for Prices and List of Sizes.

ALSO ADAPTED FOR
Iron and Steel Heating,

For Hull and Boiler Plates, Tubes, Bending, Straightening and Laying Up Work.

THE "WELLS LIGHT"
WALLWORK & WELLS' PATENTS.

2000 CANDLE POWER!

ESPECIALLY ADAPTED FOR

Dry Docks and Night Loading.

PORTABLE,
ENTIRELY SELF-CONTAINED,
REQUIRES NO OUTSIDE MOTIVE POWER,
UNAFFECTED BY WEATHER,
NO SPRAY, NO SMOKE, SAFE AND ECONOMICAL.
IN USE ON 15 DRY DOCKS ON THE LAKES.

☞ For further particulars, address

WILLIAM HALPIN,

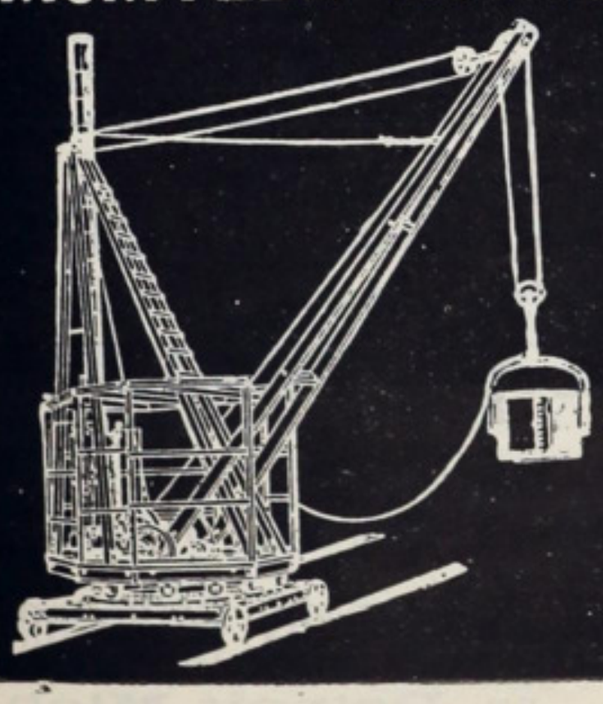
Successor to KEEGAN & HALPIN,

45 and 46 Washington St., NEW YORK.

McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

McMYLER PATENT REVOLVING STEAM DERRICK

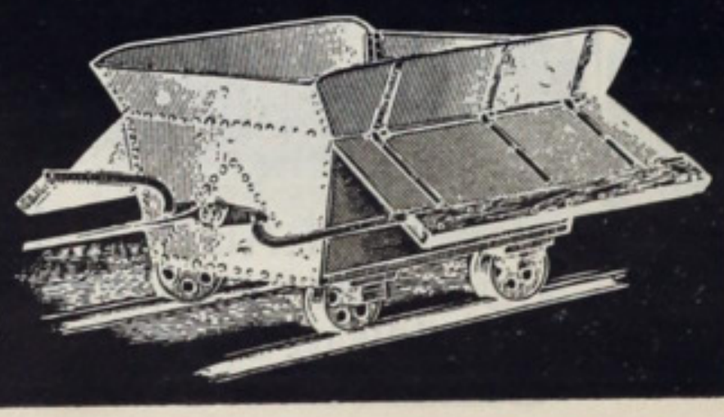


FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE BUCKETS AND DUMP CARS.



STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.
CARPETS, OIL CLOTHS,
CURTAINS, &c., &c.
Supplied at WHOLESALE RATES.

C O A L

STANLEY B. SMITH & CO.
OPERATING
SMITH'S COAL DOCK,
Detroit, Mich.
Pocket Fueling and Low Dock,
ALSO
LORAIN COAL DOCK,
Lorain, Ohio.
LAKE SHIPPERS OF
STEAMBOAT AND STEAM
COAL.
STEAMBOAT FUELING.

C O A L

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

654 Seneca Street, Cleveland, Ohio.

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules Designed for Lake Vessels.
Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer Surveyor.

GEORGE W. WILLIAMS. 211 King Street, West Bay City, Mich., Surveyor for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

EDWARD CASKIN. Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' As'n, Ltd.
Post Building, 16 and 18 Exchange Place, . NEW YORK.

DAVID WHITNEY, JR., President. THE F. H. WHITNEY, Secretary

MICHIGAN
Fire and Marine Insurance Company,
DETROIT, MICH.

CASH CAPITAL, - - - $ 400,000.00
CASH ASSETS, - - - - 840,000.00
LOSSES PAID, - - - - 1,800,000.00

THIS COMPANY DOES A GENERAL MARINE BUSINESS on the GREAT LAKES.
AGENTS AT ALL PRINCIPAL LAKE PORTS.

INCORPORATED 1794.

Insurance Company of North America.

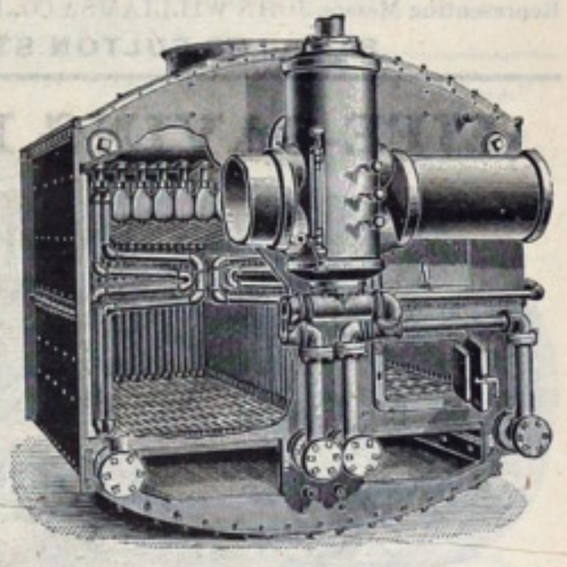
CAPITAL, Paid up in Cash, - - $3,000,000.00
ASSETS, . - - - - - - - 9,744,513.70

CHARLES PLATT, President. WILLIAM A. PLATT, Vice-President,
EUGENE L. ELLISON, 2nd Vice-President. GREVILLE E. FRYER, Sec'y. & Treas.
JOHN H. ATWOOD, Assistant Secretary.

Lake Marine Department.

GEORGE L. McCURDY, Manager.
CHICAGO, ILLS.

ALMY'S PATENT SECTIONAL WATER TUBE BOILER.



The Most Efficient and Reliable Water Tube Boiler on the Market.
is neither a copy nor an infringement of any other Boiler.

MANUFACTURED BY
The Almy Water Tube Boiler Co.
No. 47 CLIFFORD STREET,
PROVIDENCE, R. I.

W. W. LAWRENCE & CO.

PITTSBURGH, PA.,

Solicit the Orders and inquiries of large buyers of

WHITE LEAD, LINSEED OIL, COLORS, READY-MIXED PAINTS, VARNISHES and BRUSHES.

Possessing unsurpassed facilities for manufacturing, we can sell the best Paints at prices ordinarily asked by others fo inferior qualities.

Catalogues, Prices, Color Cards, etc. Free on Application.

OFFICE AND WORKS: Water Street, below Penn Ave.

WARD BOILERS FOR STEAMERS LARGE OR SMALL

LIGHT WEIGHT, GREAT POWER

THREE TYPES

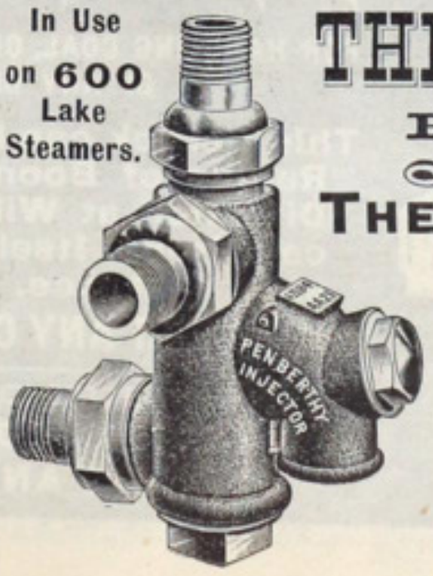
LAUNCH, NAVY AND MARINE.

ADOPTED BY U.S. GOVERNMENT. WAR VESSELS, LAUNCHES, REVENUE CUTTERS, TUGS.

AFTER THE MOST EXHAUSTIVE COMPETITIVE TESTS. Correspondence Invited.

CHARLES WARD,
CHARLESTON, KANAWHA CO., W. VA.

In Use on 600 Lake Steamers.



THE BEST INJECTOR
For Marine Use.
THE PENBERTHY.

It has been tried by 70,000 Steam Users, and all are satisfied.

PENBERTHY INJECTOR CO.
H-93 Detroit, Mich.